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Paton Calls for Reorganization of Science

18140190 Moscow IZVESTIYA in Russian
8 Mar 89 p 4

[Interview by Ye. Manucharova, IZVESTIYA special correspondent, with Academician Boris Yevgenyevich Paton: "Is Progress Possible, When Minds Are Inert"; first three paragraphs are source supplied introductions.]

[Text] Boris Yevgenyevich Paton needs no introduction. His works (in metallurgy, electric welding, and new technologies and materials) have gone solidly into world science of new materials and technologies. He leads the world-renowned Electric Welding Institute and the powerful MNTK [Interbranch Scientific-Technical Complex] which has appeared on its basis. He is president of the Ukrainian Academy of Sciences, twice a Hero of Socialist Labor, and a winner of the Lenin and State Prizes.

Academician B.Ye. Paton has been nominated as a candidate people's deputy from the CPSU. His pre-election program is based on the party platform, set forth in the CPSU Central Committee address "To the Party and the Soviet People."

These days, Boris Yevgenyevich often spends a great deal of time at enterprises and scientific research institutes, discussing the meaning and purpose of his program with the voters. These entirely coincide with the meaning and purpose of his own life. Today's conversation is about this.

IZVESTIYA: Boris Yevgenyevich! What is going on in our science? It has lost prestige and has ceased being attractive for youth. This seems serious.

B. Ye. Paton: And alarming. However, you must remember that the process of devaluation is deep and did not start today. The reasons for decline are understandable. Science is part of the social organism. Everything that has distorted society's life has also reflected on scientists and deformed their purposes and mores. Must we speak of those years yet again? I have no desire to compete with historians in analyzing the past.

IZVESTIYA: I am here to speak of today. At a recent scientific society meeting in Moscow the academy was reproached for elitism, which hinders both the academic community itself, as well as science on the whole. Why is this?

B. Ye. Paton: Here, the point lies not in the personal motives of individuals, but in the system. It must be improved, and quite radically. In other words, the organization of the scientific process should be structured along different principles. This is only possible given one condition: if we change the science's position in the state. We need a special law on science, which would raise its

role, determine the operating principles of its organizational structures, and strengthen the rights and responsibilities of scientists. This law is one of the basic and mandatory points of my pre-election program. I will fight for it: given its current position, science is doomed to play the role of a servant to omnipotent monopolists—the departments and ministries.

The humiliating lack of rights is one of the reasons for immorality. After all, the essence of our profession is the search for truth. The fight for truth is the basis of our morals. However, right now the truths discovered by scientists are rejected like a foreign body, if they are unfavorable for the departments.

We must understand: disdain for truth corrupts not only those who, by reason of group interest, push multi-billion anti-scientific projects into the national economy, but also scientists who end up being unnecessary because of their professionalism. Time after time, life persuades young people: it is very convenient to be a conformist, to turn with the wind, substantiating any project sent from above with pseudo-scientific phrases. Thus, weather-cocks and imitators are cultivated. It is easier for them to live, than it is for the first to pass through. This has always been so. However, now it has become advantageous as well.

IZVESTIYA: And no one puts anyone to shame?

B. Ye. Paton: You believe in the humanizing strength of words. Naturally. However, first there was work: it raised us above the rest of the living world. Work has made and makes man what he is. When you do not know how to work, everything ends up as nothing more than a literary declaration—both honor, and nobility, and charity, and kindness. Worst of all: when a person does not know how to do a job and holds another's place, in order to hold his ground he resolves to do the most diverse immoral deeds. In science as well, you must know above all how to work. We should talk about the organization of scientific work, with me, in any case, since this is my profession and my position.

The "work ethic" in our country is extremely low. In other words: we are unashamed of Oblomovism and work slowly, without initiative, without quality. Our Western partners complain about the difficulty of contacts with Soviet collectives. We are uninteresting to them, because we have become thoroughly bureaucratized—both in management style and in subordination stereotypes, as well as in the overall standardization of thinking. Such a life is convenient for passive people. It offers a collective sense of security. If you know how to avoid decisions, passing the responsibility upwards, if you remain a "simple soldier of science," then the demands made of you are also small and you can live peacefully. People begin to realize this simple truth even

before their student days—in the elementary schools. But we are paying for this: our diplomas of higher education (for instance, the title of physician) are not taken seriously in the West.

We must not put up with any more of this. The main principle, on which the restructuring of the Ukrainian Academy of Sciences is now based, is to radically raise the independence and responsibility of scientific collectives. The new status demands initiative, enterprise and non-trivial thinking of people. It demands. However, it is being implemented far from immediately. It is hard to shake loose the inertia of the former style. Our institutes still do not know how to use the possibilities granted to them, and some do not even know that they do not want to know (there are such)—they are hoping to get by as before.

Nonetheless, in any case it cannot be said that we are standing still: the rights of institutes have already been expanded—above all in planning and financing exploratory research. They entirely independently solve all problems related to the plans for application, as well as those related to developing structure and staffs. However, life moves on ahead so quickly, that a much of that which seemed progressive yesterday, is becoming an anachronism today. We have been forced to admit that our institutes do not have the degree of independence, like that which was granted to industrial enterprises and sectorial scientific research organizations (not to mention cooperatives!). If we do not take further steps, if we do not manage to get the intersectorial scientific and technical complexes going, if we do not resolve to considerably expand the rights of scientific research institutes (including on matters of wages), we will not raise either the effectiveness of science, or the morality of the scientist.

IZVESTIYA: A good slogan—"All power to the institutes"—is being promoted by scientific youth. This means that people want to act. Will the independence of scientific research institutes help to reveal true talent and personality there?

B. Ye. Paton: The responsibility of scientific research institutes for themselves forces them to seek talent, if, of course, we do not turn scientific research institutes into monopolists. It is long past time to truly convert to the principles of grants and finance work on a competitive basis. Unfortunately, we still are not fully employing the possibilities inherent in this principle. For now, there is more talk than action. Even when contests are held, their results are often notoriously pre-decided. This falsity (customary in previous years) inevitably demoralizes the collectives. It presumes the unchecked nature of people with power. Competitive rivalry should become lively work, a genuine intellectual rivalry, where the researchers' professional and personal qualities are really visible. Only under these conditions will people with independent thinking and a firm will be advanced.

Today, the need for these people in particular has grown, because man's interrelations with nature have become extremely complicated. Its resources are at the limit, but the economy must develop. One solution is to create and apply fundamentally new technologies which are closed, ecologically clean, and sparing and conservative of natural wealth.

I consider the struggle for such technologies to be one of the most important tasks of my life—regardless of whether or not I am elected. This is also a mandatory point of my program. It is vitally necessary to raise the country's technological potential.

IZVESTIYA: This noble struggle has a long history. We published the article: "On the Dnepr" 12 years ago. This means that your academy created the program to protect the great river, which the article wrote about, 15 years ago. However, victory has only now been gained: government resolutions have finally been passed which protect the estuary, and the Danube, thank God, will not flow into the Dnepr. Everyone knows that the academy waged this struggle against the departments from the highest civic and scientific positions, but at that time the departmental interests which shaped the economic mechanism were stronger than strong arguments.

B. Ye. Paton: This mechanism is being fundamentally destroyed. However, both departmental and interdepartmental barriers remain to this day. I hope that many deputies (just as I) have a vitally important task—to eliminate all of these barriers.

Here, I would like to return to the beginning of the conversation—to that which is in fact needed in order to raise the significance of scientific recommendations. Let us talk about expert analysis: the most sharp problem of the reliability and level of decisions relates to it.

The organization of expert analysis in the country is poor for the present time. Even the scientists themselves display no particular desire to work as experts. Some, so to speak, have "freed their hands," and others do not have the necessary skills. Yet, the need for objective expert analysis is acute. In our opinion, the law on science needs to have a special point on interdepartmental expert analysis and the mandatory nature of its conclusions for practical workers. This is particularly topical right now, since the danger of an international departmental lobby has strengthened.

In developing and implementing large-scale national economic projects, expert analysis is an important (and sometimes the only) means, which allows us to pit reason against the voluntaristic pressures of sectors, a pressure which turns into the destruction of the earth, water, and atmosphere—all of that, which we scornfully began calling "the surrounding environment," when in fact this is Mother Nature, the grounds and conditions of vital life. If one is really speaking seriously of the decline in morals, then one must speak above all of indifference

toward nature. If we can risk it, destroy it, then that we are only people enjoying a position of power, for whom permissiveness is a strict standard of life. However, I repeat: so as not to reproach scientists for cowardice and irresponsible indifference, we must protect science itself—we must give it an opportunity to develop. Science is an inalienable part of culture. The level of thinking, the spirituality of the people and its intellect and, thus, the might of the state as well, depend on the level of culture. However, does everyone realize this?

IZVESTIYA: Boris Yevgenyevich! Will you tell us how to correct the situation in science? On what principles should work be based? What will you struggle for, if you become a deputy?

B. Ye. Paton: It seems to me that the sensible organization of science within the state should be founded on three main points: the selection of priority directions, the creation of large scientific programs, and expert analysis. The independence of institutes in no way contradicts the planned orientation of research, which should be developed by the collective reason of scientists.

Right now a tremendous number of scientific and scientific-technical programs have once again appeared in the country. This scatters forces and resources and leads to the devaluation of the concept of "research" itself. The number of such programs should be reduced. However, work on them should mandatorily be brought up to world-class results—up to the creation of advanced, competitive technologies.

We need a carefully thought-out, thoroughly weighed policy of priorities, which is of key significance for the fates of scientific and technical progress. This is so important, that I believe it necessary to give a state status to priority areas and assert their superior legislative authority. This seems understandable: to put it mildly, we must not spread the small amount of resources that the country has over a large area. We must (figuratively speaking) put the money in piles and aim only for the most important things.

Here, it is also necessary to clearly understand that once again it is not a matter of the personal qualities of the leaders of scientific directions, or of someone's devotion to one or another project, but the selection of great ideas, or more correctly, the creation of a scientific system for selection. The level of forecasts determines this. Ignoring scientific forecasts, treating them as something secondary, leads to unsubstantiated priorities and, for the country, becomes a lag behind the world level in the most important areas. (For example, this occurred in ferrous metallurgy and computer hardware).

In the academy, the main role belongs to basic research—this is the foundation of foundations and is the basis upon which applied research is developed and improved technologies are created. However, again their application requires an uncompromising struggle against

various bureaucratic hurdles. Right now, the simplest things have been made complicated. For instance, in my opinion, a situation in which a scientist, having achieved an important result, would be able to turn painlessly to industry for the broad-scale application of his developments, and then return to scientific research again, would be absolutely natural. Similar opportunities should be available for workers in industry. For instance, for those who propose promising ideas that require theoretical development. This would accelerate the rates of scientific and technical progress.

The reorganization of science is inseparably linked to overall processes—to restructuring. Meanwhile, it has still not gained full strength and here and there is simply spinning its wheels. Not a single person who considers himself a son of the Homeland can remain indifferent to this. Our duty is work, painstaking and selfless, to make restructuring irreversible.

Scholars Call for Reforms in USSR Academy of Sciences

18140182 Moscow SOVETSKAYA KULTURA in Russian 2 Mar 89 p 2

[Letter to SOVETSKAYA KULTURA under the rubric "Letter to the Editorial Board": "Changes Are Needed"]

[Text] In our conviction, today, as never before, the restructuring of the work of the USSR Academy of Sciences is necessary. Without the establishment of consistently democratic principles of the management of the scientific process, without the clear specification of not only the duties, but also the rights of rank and file scientific associates, and without the creation of favorable conditions for the identification and growth of scientific talents, it is difficult to count on the intelligent organization of domestic science and on the obtaining of the maximum return from it by society. Meanwhile, in each of these directions changes are occurring too slowly, or are not occurring at all. Not by chance in the number of critical articles, which have been addressed to it, has the USSR Academy of Sciences already approached the regrettably famous Ministry of Land Reclamation and Water Resources. There are several reasons for such a situation; we would like to direct attention to one of the most important—to how at the USSR Academy of Sciences they prepare and make any major decisions, including ones which seem to be aimed at the restructuring of academic life.

The tens of thousands of scientists, who work in the system of the academy, to this day are deprived of the right to vote in those instances, when only several hundred full members and corresponding members of the USSR Academy of Sciences, who were not elected by them, decide at their assemblies the means and conditions of the development of entire scientific collectives. The Temporary Charter of the Scientific Research Institute of the USSR Academy of Sciences, it would seem, broadened the rights of the elected scientific councils of

institutes. But in the text of the Charter there proved to be so many provisions, which permit different interpretation, that in practice the councils are reduced to the role of a simple consultative organ attached to the director and thereby are not capable of influencing the scientific organizational policy of departments and the presidium. In turn, the director of an institute is far more dependent on the "leadership" than on the "masses" of the academy, since in conformity with the Statute on the Procedure of the Filling of Positions of the Management Staff at Scientific Research Institutes of the USSR Academy of Sciences the role of a simple poll of the opinions of subordinates is assigned to the vote of the collective of the institute on the candidate director, while the right of a real decision is given to the general assembly of the corresponding department. And the following clause of the Statute: "The appointment to the position of heads of scientific research subdivisions of members of the USSR Academy of Sciences is made by the director of the institute without competition and selection," does not need comments at all—especially against the background of the decisions of the 19th party conference on the democratization of the work of the party and Soviets.

How did it happen that in charter documents, which were adopted by the USSR Academy of Sciences not during the era of stagnation, but in 1987, the privileges of a narrow group of people are consistently preserved—to the detriment of the democratic rights of an enormous majority of scientific personnel? The drafts of the documents were already bad, the mechanism of their adoption is also bad. The drafts were sent out to the institutes for discussion. At a number of institutes decisions on the drafts, which contained their fundamental criticism and alternative proposals, were adopted. However, both the conservative spirit and the bureaucratic letter of the drafts were completely retained in the final documents, which were approved by the Presidium of the USSR Academy of Sciences. Did anyone at all from the academic leadership read the proposals of enthusiasts, who had counted on their listening to their opinion? We believe that they hardly did—and this is essentially natural. For an opinion is cheap without the right to get a response to it and without the opportunity to defend it in front of opponents.

While the initiative of any changes is monopolized at the highest level of the USSR Academy of Sciences, and the academic "masses" are eliminated from effective participation in the elaboration and making of decisions, in the matter of democratization the academy will lag behind society, or else will entirely mark time, while portraying the semblance of reforms and in so doing assuring the public again and again that there is no difference between cooptation and election, between dialog and indicatory monolog, between democratic and pressure management. The vote of the expanded presidium of the USSR Academy of Sciences, which took place on 18 January 1989 and removed from further participation in the election campaign a number of precisely the candidates for USSR people's deputies, who received the most support of scientific collectives, also confirmed this. It has become quite

obvious that a realistic and self-critical discussion on the stagnation phenomena in the scientific and social life of the USSR Academy of Sciences is of vital necessity and that the division of scientists into "elite" members of the academy and "second-rate" personnel should give way to the equal, representative, and open participation of all academic scientists in the solution of the problems of the management and organization of science and in the elaboration of the optimum strategies of scientific research.

It is necessary to establish an extraordinary general assembly of the USSR Academy of Sciences, having given it the form of an academywide congress or conference. Delegates from scientific institutions, who have been directly elected by their collectives, have received mandates from their constituents, and have an equal right to vote with academicians when adopting decisions, should participate in it. Such a powerful potential of creative thought, which has been accumulated by academic institutes, would be mobilized for the cause of transforming their own life.

To start with we propose a small and simple thing: to gather all together and to listen to each other, to argue about the general conditions of the work of the academy, including the new methods of the financing and programming of scientific work, about the human and personal factors in the activity of the academy, about the means and time of the democratization of academic life, and about the lessons of the election of USSR people's deputies from the Academy of Sciences (incidentally, they could be elected precisely at such a conference). In the end not only the scientists who work at the USSR Academy of Sciences need such a discussion—after all, the process of the humanization of the life of our entire society depends to an enormous degree on the modernization and growth of science.

[Signed] Candidate of Historical Sciences L. Batkin; Doctor of Historical Sciences L. Gordon; Doctor of Historical Sciences I. Dyakonov; Doctor of Philological Sciences Vyach. Ivanov; Doctor of Philosophical Sciences I. Kon; Doctor of Historical Sciences M. Kryukov; Candidate of Historical Sciences S. Panorin; Doctor of Historical Sciences A. Preobrazhenskiy; Candidate of Historical Sciences A. Formozov, and others. In all 61 signatures.

MNTK Chief Lacks Control Over Component Institutions

18140180 Moscow SOTSIALISTICHESKAYA
INDUSTRIYA in Russian 28 Feb 89 p 1

[Interview with Corresponding Member of the USSR Academy of Sciences Vladimir Ivanovich Revnivtsev, general director of the Mekhanobr Interbranch Scientific Technical Complex, by I. Mosin under the rubric "How Are Things at the Interbranch Scientific Technical Complex?": "Reliance on a Breakthrough"; date and place not indicated; first two paragraphs are SOTSIALISTICHESKAYA INDUSTRIYA introduction]

[Text] At times it seems to me that someone is deliberately hindering precisely the most advanced ideas and solutions. Judge for yourselves: 3 years have passed since

the decree on the establishment of interbranch scientific technical complexes was adopted, the talk that a new statute on their activity, which conforms to the economic reform, is needed has been going on for more than a year. But there is still no document.

The person I am talking with is Corresponding Member of the USSR Academy of Sciences V. Revnitssev, general director of the Mekhanobr Interbranch Scientific Technical Complex and a people's deputy candidate from the All-Union Society of Inventors and Efficiency Experts. It is understandable that the problems of innovators, the main one of which is introduction, are in first place in his election program. He also defends interbranch scientific technical complexes first of all because they can drastically shorten the path from the idea to embodiment. But for the present....

V. I. Revnitssev: For the present I am like a general without an army, the scientist says regretfully. Rather, there is an army: 25 institutes and 13 plants, which belong to 11 ministries and departments, to one extent or another have been called up under the banners of Mekhanobr. But it is impossible to manage this bulky and cumbersome thing properly—I have neither the economic nor the administrative levers for this. When it is necessary to settle some question, I have to either complain or try to persuade.

In my opinion, life is not teaching us anything, the scientist continues with bitterness. How long is it possible to repeat the same mistakes? Recall the incident with the establishment of scientific production associations. How much a fuss there was about them, how many assurances there were that precisely they will lead us to the heights of scientific and technical progress. But the idea of scientific production associations simply died, because the sectors that are monopolists do not need new equipment, to this day they can exist comfortably by producing obsolete products. And today, make note, no one remembers any more the advantages of scientific production associations. Seeing that a new form of the integration of science with production has appeared—interbranch scientific technical complexes. With regard to them there were again glowing hopes and the loud statements that this time we had not made a mistake and interbranch scientific technical complexes will ensure a breakthrough in the decisive directions of technical progress. But interbranch scientific technical complexes "got parched" and bashfully passed into the shadow even more rapidly than scientific production associations. And voices are already being heard that only MGO's—interbranch state associations.... Now they....

It seems to me that it is time to put an end to such economic adventurism and to cease plunging from side to side. I am thoroughly convinced that both the idea of scientific production associations and the idea of interbranch scientific technical complexes are fruitful and

viable. It is necessary only to make them comprehensible. One must not abandon a matter half way merely because the first attempt did not succeed. And dash to think up the next panacea.

SOTSIALISTICHESKAYA INDUSTRIYA: I fear that after such disillusionments you are reevaluating the chances to revive the idea of interbranch scientific technical complexes.

V. I. Revnitssev: Why do you say revive? I believe that interbranch scientific technical complexes have not yet even begun to live properly. The experience of our Mekhanobr shows that there are enormous potentials in their idea. It is necessary merely to help them to get on their feet. But they are again attempting to drown them little by little in debates, documents, and the bureaucratic whirl.

The new statute on complexes, which at last should put economic levers in our hands, has been under preparation for more than a year now. During one of the conferences of managers of interbranch scientific technical complexes a kind of "brainstorming" with regard to what principles should be made the basis of their activity was held. At that conference many proposals, which were conceived in suffering and were advanced, were voiced. But now drafts of the new statute on interbranch scientific technical complexes are coming to us. And it turns out that not only did the logic and advanced solutions not remain in them—they are entirely void of common sense. One would like to know who is preparing these drafts? Are they passing through some bureaucratic machine? Why do they not want to listen to the opinion of experienced workers? All our previous experience shows that one must not entrust ministries and departments with the preparation of such documents. In order to retain power, they will emasculate them to the utmost....

SOTSIALISTICHESKAYA INDUSTRIYA: Vladimir Ivanovich, why do you need this statute on interbranch scientific technical complexes and the priorities, funds, and limits of all sorts that are there? For the Law on the State Enterprise applies to complexes. Go and work by relying on it.

V. I. Revnitssev: It is impossible. For example, we need new materials, but we cannot buy them anywhere—in the country there is no free market. One has to make the rounds again of ministries and departments with one's hand held out. They both were and have remained the masters of the situation. And introduction? We have already developed six generations of new crushers, but plants, as before, are in no hurry to assimilate their production. Why, if they are snatching up so the old product with their hands? We had hoped that by means of state orders we would succeed in "driving" the new equipment into the plans of enterprises. But they have learned to evade us very cunningly.

There are many means. Take the same prices—today they are, after all, contract prices. But with whom is there to come to an agreement? We, for example, got an agreement with a client on the price for our mill in the amount of 320,000 rubles and proposed to the Ministry of Heavy, Power, and Transport Machine Building to include it in a state order. But the producer artificially inflated the price to 850,000 rubles, which the user simply cannot squeeze out. Is it not a loophole to evade the assimilation of new equipment? And everything seems to be as it must—there are neither right people nor guilty people.

While some enterprises have the monopoly right to the output of a specific product and while there is no real competition, science will remain in the position of a petitioner. Such is the present economic situation, in which interbranch scientific technical complexes have not simply to live, but to fight desperately for existence. To fight also because all the privileges promised to them—priorities in material and technical supply and in the obtaining of credits, the possibility of disposing of their product themselves—simply remained promises. But without this the reliance on the idea of interbranch scientific technical complexes as a shock force of progress is simply groundless.

SOTSIALISTICHESKAYA INDUSTRIYA: But are you certain that in the very idea of interbranch scientific technical complexes there is a rational grain, that they have the right to exist? Is there not concealed behind them an attempt of the scientific bureaucracy to create just another myth about a panacea which promises to solve all problems?

V. I. Revnitssev: No, the idea of interbranch scientific technical complexes was brought to life by the vital needs of practice. Not only the most promising discoveries originate at the meeting points of sciences: the most perfect equipment is, as a rule, the result of the efforts of many sectors. In interbranch scientific technical complexes we attempted precisely to create opportunities for the interaction of sciences and sectors. Moreover, we gave them production capacities so that advanced ideas could be immediately embodied in equipment and technologies of the latest generations. The idea is sound. And, as the experience of Mekhanobr showed, it is quite productive.

As I have already said, in 3 years we developed six generations of crushing equipment, in each of which completely new principles of operation were embodied. They are based on discoveries made at the institute in the field of fracture mechanics. Of 50 types of equipment, 37 are competitive on the world market. Bulgarians, Frenchmen, Americans, and Finns have addressed to us proposals on the establishment of joint ventures. A contract with Italians for the delivery of our equipment worth \$1 million has just been signed. There are many potential foreign clients, they are ready to pay in currency. But how is one to come to an agreement with

them, if we simply cannot see to it that our equipment would finally begin to be series produced? Only now are we succeeding with much difficulty in putting into flow production equipment of...the first generation.

In the opinion of specialists, in the area of crushing equipment we hold today the leading position in the world. Foreign firms are willing to cooperate with us. We took \$8 million in credit and bought with it equipment for basic research. In equipment, potential, and scientific accumulations Mekhanobr now has no equals. But this is today. And what will there be tomorrow? Most of all I fear that our ideas will become obsolete, never having found an outlet to practice. And we will begin to purchase abroad for currency the equipment we invented.

SOTSIALISTICHESKAYA INDUSTRIYA: But, judging from your words, an outlet suggests itself: since we are not capable of implementing our own ideas, we must agree to the establishment of joint ventures and must earn currency.

V. I. Revnitssev: This question is not as simple as it seems. If you look at the established joint ventures, you will notice that, in spite of the significant number, for the present they do not have any serious influence on our economy. Moreover, the majority of them produce products, which you would not call either science-intensive or superprofitable. Is this by chance?

Yes, we have many proposals on the establishment of joint ventures. But what terms are they offering us? The ideas are ours, the production is ours, the manpower is ours. While the partners would like merely to provide this equipment with components which we do not have. And to sell it. The profit, of course, is split in half. But given such a division of obligations one need not talk of a serious contribution on their part. And many of them buy components from other firms. Their only real concern is marketing. Here a question arises: Is such a deal profitable for us?

In my opinion, not very. We are quite capable of buying the components ourselves and of selling our commodity ourselves. Here the entire profit will be ours. In any case, for the present we do not have competitors in this area, for the present we are capable of enriching the world market with new products, it is necessary to take advantage of the situation and to derive the maximum profit from it. It is time for us to learn to live in accordance with the laws of the world market. But there no one is going to share his profit without an urgent need.

SOTSIALISTICHESKAYA INDUSTRIYA: Wait, Vladimir Ivanovich. Your view of joint ventures is somewhat unexpected. But what about the Chinese experience?

V. I. Revnitssev: At one time I carefully studied the specific nature of the operation of joint ventures in China. A wise and far-sighted policy is being pursued

there—with an orientation toward the output of very science-intensive, expensive, superprofitable products: color televisions, chips, video equipment, and electronic items. Here they attempted to attract as partners so-called huaqiao—their former countrymen who live abroad. While the latter with great willingness invested money in joint ventures in their native land.

But here I would also like to caution: it is not worth placing trust only in the experience of others. It originated on different soil, at a different time. It is necessary to study it and to attempt to take all the best. But at the same time to seek our own way. According to my calculations, about 10 percent of our completed scientific and technical developments are entirely competitive on the world market of ideas. One must not attempt to catch up with the rivals in all directions. This is a bluff. It is necessary to invest money in the most promising ideas of this 10 percent. Only by means of them do we have a chance to break into the world market, to earn currency, to grow stronger, and to expand our base.

It is necessary to actually realize that no one is voluntarily going to share with us a piece of their pie. It is necessary to strike through, to break through to the world market and to prove our right to a place in the sun. It is possible to do this only by means of leading ideas.

Success of Temporary Collectives in Introducing New Technology

*18140166 Moscow IZOBRETATEL I
RATSIONALIZATOR in Russian
No 11, Nov 88 pp 10-11*

[Interview with V.B. Yuzhina, VOIR Central Council deputy chairman, O.Ya. Gorn, VOIR Central Council deputy department chief, and V.N. Kornilov and Ye.M. Tikhomirov, VOIR Central Council department chiefs: "Real Work—Real Interests—Real Results"; first paragraph is IZOBRETATEL I RATSIONALIZATOR introduction]

[Text] At a recent meeting between VOIR [All-Union Society of Inventors and Rationalizers] Central Council employees and the editors of this journal, the new forms of activity of our volunteer societies, related to the implementation of inventions, were discussed.

IZOBRETATEL I RATSIONALIZATOR: The times are fairly tempestuous and energetic now, one could say— young. Hopes for the better are related in many ways to full cost-accounting, without which, obviously, the economy will not be boosted. Our inventions, it seems, the successes of which are modest in terms of application for present time, will also not be boosted without cost-accounting. New economic thinking always entails new forms of economic activity. What new things has the VOIR undertaken in this area recently?

V. B. Yuzhina, VOIR Central Council deputy chairman: Problems with applying innovations have always been a sore point in our invention work, but in recent years this illness has become chronic. This was seriously discussed at the 7th VOIR Congress (See IR, Nos 7-9, 88). Right now, we are trying to actively involve inventors, rationalizers and other specialists of the national economy in the process of applying innovations by way of cost-accounting relations. Temporary creative collectives (VTK) have become the basis for this.

O.Ya. Gorn, VOIR Central Council deputy department chief: Until recently, besides enterprises, VOIR councils were engaged in selecting inventions for application. On a country-wide scale, the most significant works were examined by the Interdepartmental Commission under USSR Gosplan. It included very high-ranking officials. The commission meets no more than 2-3 times per year. Over its existence, the commission managed to consider about 800 important inventions. In the past, the commission mainly resolved, for instance, to instruct Minkhimprom or Minradioprom to ensure the output of a certain product. Today, its decisions are of another sort. It can write approximately the following: the chief of a consolidated department of USSR Gosplan must form a certain state order. Yet, who knows if an enterprise will take it or not.

Yuzhina: If it succeeds in forming a favorable state order, one could say that the invention was fortunate: the enterprises will not overlook such an order. We hope that the new situation will make the Interdepartmental Commission's work more effective. However it is clear that one commission, no matter how authoritative it may be, will be unable to cover the entire vast front of application work.

Gorn: The implementation of innovations will only cease being an insoluble problem when we manage to create a system for mass application, when engineers, scientists and production workers take a personal interest in this work. We see organizing application collectives directly in the enterprises as one way. Let payment for their activity be directly related to the final result.

After searches and debates, a form, new for the VOIR, crystallized—temporary creative collectives.

The plan of action is as follows. An enterprise, wishing to apply a certain innovation for itself, turns to the oblast or republic VOIR council. This, with the assistance of an application center, creates an VTK made up of this type of specialist.

IZOBRETATEL I RATSIONALIZATOR: What do you mean "creates?" Do people join a VTK on their own, or must they be dragged there, so to speak, through a voluntary-compulsory procedure?

Gorn: They join on their own and willingly. What attracts them? Work in a VTK is not considered holding two jobs at once. Payment for this work is not limited to half one's pay rate. It is also important that any citizen of the country can work in a VTK. For instance, someone lives in Kazan, but is invited, as a specialist, to join a VTK in Tyumen. This system is also very attractive for the enterprise. They planned, for instance, to apply an innovation, but the design bureau has no appropriate specialists. They must look for... Hire for a half-year... And then what? Indeed, there is usually not a single spare kopek in the wage fund. As a rule, things are easier with resources from the science and technology development fund. The enterprise transfers these to the account of the application center under the local VOIR Council, where the VTK is formed. The enterprise grants the creative collectives its production space and equipment. Incidentally, these will be used more completely in this manner. For an enterprise, the fact that the application of a new machine tool or technical production line, which a VTK is working on, can be included in its own plan and that the necessary materials for implementing this project can be legally obtained is also important. However, for enterprises it is most important that the time periods for applying innovations are reduced several-fold, compared to times when state enterprises and organizations are involved (typical for all paths) in application. Also, the innovation costs the enterprise much less.

Yuzhina: There was, as you recall, an attempt to create intersectorial temporary creative collectives. For 10 years, throughout the whole country, there was not even a handful of them... The idea was interesting, but fell through. Why? Really, because the specialists who were included in such a collective had to work in it for 2 or sometimes even 3 years. Basic projects were taken up. The parent enterprise looked askance at its "traveling" associate. His job had to be kept, but what was the return?..

Gorn: The application VTK should be created directly where needed. Today, application centers, organized under republic, oblast and large city VOIR councils, are forming them. The AUCCTU [All-Union Central Council of Trade Unions] has passed several resolutions ensuring the work of these collectives, new to the VOIR, and our Central Council has developed a complete set of standard documents for its centers and for the VTK.

IZOBRETATEL I RATSIONALIZATOR: The resolutions were signed at the AUCCTU in early 1988. Enough time has passed, to evaluate whether they are working well or poorly.

Gorn: To be honest, not everyone immediately understood what a VTK is. We explained, persuaded... The first swallow has flown from Moscow...

V.N. Kornilov, VOIR Central Council department chief: The first VTKs were created with our help. Geologists repeatedly turned to us with a request to help them

organize the development of new technology for prospecting for useful minerals. We have ties with many scientific and educational organizations. In particular, we know that this kind of work is being done at Moscow State University imeni Lomonosov. We decided to turn to the university scientists. G.P. Kudryavtseva, laboratory chief, leading scientific associate, doctor of geomineal sciences, willingly responded. Under her guidance, we created two temporary creative collectives numbering about 25 people. Students also joined the scientific associates. This is real work for them. They also earn more, than they do unloading railroad cars at night. The "Arkhangelskgeologiya" and "Aerogeologiya" production geological associations acted as customers. By contract, each allocated about 50,000 rubles for the development work. We created an authoritative expert committee made up of scientists, production workers and economists, and invited specialists from Mingeo, the USSR GKNT [State Committee for Science and Technology], and the USSR Academy of Sciences. They evaluated the topicality and novelty of the proposed developments and the possible economic effect, and the VTK began work. The work was broken down into four stages. The customers have already accepted the results of the first two stages with a high rating.

IZOBRETATEL I RATSIONALIZATOR: If you can, tell us briefly about the technology.

Kornilov: In order to evaluate a deposit, they usually drill, for instance, 100 wells, but using the university VTK's method only ten wells are required. The savings for a single geological expedition comprise on the order of 250,000 rubles annually.

Yuzhina: I would like to state that this work is being done at the very highest, modern level, using the latest laboratory equipment, which was not being fully used by the university previously. It was practically inaccessible for the Arkhangelsk geologists.

IZOBRETATEL I RATSIONALIZATOR: How do they treat the VOIR VTK at the university?

Kornilov: Through our VTK, through the VOIR, Moscow University is going into direct introduction in this case. There is no need to run to Gosplan, and then somewhere else, and then to struggle for something... They developed it, and it went immediately into industry.

IZOBRETATEL I RATSIONALIZATOR: Are there many such collectives under the VOIR right now?

Gorn: It should be stated that much work had to be done, in order to bring the idea of the VTK to the aktiv and the VOIR. In time, people realized that it is worth doing, and we ought to begin. First, the initial 125 collectives sprung up. Right now, there is an outright avalanche of them. Information has been received that about 2,500 VTKs have been created under local councils. Contracts

totaling approximately 40 million rubles have been concluded with enterprises. In this regard, more than 1,500 inventions are being applied.

IZOBRETATEL I RATSIONALIZATOR: Which VOIR councils are pursuing the VTK especially actively?

Yuzhina: Above all, the Moscow Oblast Council. IR already wrote about the experience of the Kishinevites (see IR, 10, 88, pp.4-6). VTKs are working actively in Odessa, Smolensk, and Vitebsk, as well as in the Belorussian and Lithuanian republic VOIR councils.

Gorn: Not only enterprises, but local authorities are also using the services of VTKs. There are orders from ispolkoms for services for the population. Now, the VOIR councils can actively work on technical progress, passing the bureaucratic barriers which everyone has become sick and tired of.

Yuzhina: The ministries also immediately sensed the use of our system and seized at it. They saw that it is possible to economically influence an enterprise's production indicators through a VTK.

Gorn: And it is profitable for an enterprise to have business with the VOIR, with our VTKs. The directors cannot always pay for development work, but then the application center under the regional VOIR council allocates, for example, 150,000 rubles for this project, and the enterprise then repays the VOIR out of its science and technology development fund. This system unties the plant director's hands.

IZOBRETATEL I RATSIONALIZATOR: Is it possible to earn much in a VTK?

Gorn: Everything depends on the specific contract, on the time periods for execution. The VTK receives half of the sum indicated in contracts for wages for the participants. This is taxed at 13 percent, just as it is in state enterprises.

IZOBRETATEL I RATSIONALIZATOR: It seems, it is even more profitable to work in a VTK, than in a cooperative...

Yuzhina: Perhaps. This is one reason why specialists come to us willingly. Right now, the VOIR councils must work more energetically and must, as efficiently as possible, help inventors apply their proposals. It must attract the interest of enterprises, advertise the VTK's activity, and respond to the inventors themselves. These are active people.

IZOBRETATEL I RATSIONALIZATOR: Incidentally, our journal is prepared to help VOIR councils at any level with advertisement... We still have not discussed the currently fashionable cooperatives. Are they flourishing just as magnificently under the roof of the VOIR, as the VTK?

Gorn: Currently, about 80 cooperatives live under the VOIR's flag. The VOIR gives the cooperative starting capital—sometimes on a percentage basis, but sometimes free of charge. Some cooperatives, particularly those working on software, generally need little except a roof. The cooperative workers themselves decide at their meetings what percentage of income to deduct for the purse of the VOIR council that has sheltered them: 5, 10—however it is arranged.

IZOBRETATEL I RATSIONALIZATOR: Essentially, the VOIR has given inventors a choice: either to implement their own creative possibilities in a cooperative, or in a VTK. Both ways offer an opportunity both to introduce the invention, and to earn well. Judging by the number of VTKs created, they are clearly preferred. What is going on here? After all, cooperatives are growing like mushrooms everywhere right now...

Gorn: Everything depends on the project. Computer hardware specialists, for example, already have everything they need at hand and are creating cooperatives. If they want to design a brick plant that uses a hitherto unknown technology, then, while they are obtaining the expected productivity, while they are earning something, they have to puff and pant. A VTK then has more possibilities than a cooperative. The psychological element is also important. Imagine going to a director and proposing the organization of a cooperative at the plant. But the director has a prejudice: who knows these people—maybe they are swindlers... Yet it is quite another matter when a creative collective is organized under the aegis of the oblast VOIR council and specialists are invited from the center.

Yuzhina: Which form is better? Specific conditions will dictate. People themselves are deciding what is more convenient for them. Our application centers are essentially similar to cooperatives. They have full independence, self-financing and self-support.

IZOBRETATEL I RATSIONALIZATOR: VTKs are being created under the VOIR councils. Does this mean that only VOIR members can join a VTK?

Gorn: Yes, of course. Moreover, in order to become a VTK participant, a recommendation from the primary VOIR organization is required. Thus, the Society's shares are raised.

Yuzhina: Temporary creative collectives have revitalized the Society's work and raised its authority. True, this did not occur without mistakes. People took the easy way here and there, and took up any project, sometimes unrelated to invention work, in order to scrape together starting capital more rapidly. Yet, we believe that VOIR VTKs should apply precisely inventions. In short, the Society has real economic levers and the people have real incentives. Right now, a great deal depends on the initiative of local VOIR councils, which are able to effectively help inventions and inventors.

Ye.M. Tikhomirov, VOIR Central Council department chief: However, do not think that establishing temporary creative collectives occurs without a hitch. This is new work for the VOIR and, like any new thing, a whole series of difficulties appears in the path of a VTK. A fear of the new forms for organizing application work has clearly appeared in the regional councils. Thus, in Khabarovsk, Omsk, and Sakhalin they are unable to begin work at all. Yet, representatives of the Khabarovsk Kray Council stated, for example, that they only have small (!) enterprises in the kray and have no money, so therefore there is no way to create a VTK. Not all councils are using our standard materials properly. Here and there, it is deemed unnecessary to conduct a preliminary expert

analysis of the developments being proposed. However, without skilled expert analysis it is impossible to establish the correct contract prices. Trouble also lies in the fact that the apparatus of some councils is in no way being restructured for the new forms of work—inertia in thinking, and sometimes weakness of economic and legal knowledge, are telling. The shortage of skilled specialists, of lawyers above all, is being felt acutely by the council staffs. However, these are all growing pains. Unquestionably, the new form is extremely promising. We are sure that all VOIR councils will take it to arms.

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Economist Kheynman Assesses Potential for Technological Progress

18200200z Moscow PLANOVYE KHOZYAYSTVO in Russian No 1, Jan 89 pp 20-26

[Interview with S. A. Kheynman, doctor of economic sciences, professor, by S. Gubanov: "What Strategy Should Be Preferred?"; date, place, and occasion not given; first paragraph is PLANOVYE KHOZYAYSTVO introduction]

[Text] On behalf of the editorial department S. Gubanov addressed the above and other questions to the famous economist S. A. Kheynman, doctor of economic sciences, professor, chief scientific associate at the Institute of Economics of the USSR Academy of Sciences.

PLANOVYE KHOZYAYSTVO: Solomon Aronovich, please evaluate briefly the effect of the reform of economic management on the solution of problems concerning the quality of output and acceleration of scientific and technical progress.

S. A. Kheynman: First of all, it should be stated that the economic reform is proceeding not quite as envisaged. In many respects this process has proved to be more complex and contradictory. The situation in the area of scientific and technical progress remains especially contradictory, not lending itself to an unequivocal evaluation. Of course, there are definite shifts and it is impossible not to see them. At the same time, however, it must be admitted that a radical breakthrough has not yet occurred, in any event, in the main directions of social and economic development. Some problems, including those concerning the quality of output, have begun to be felt even more acutely.

PLANOVYE KHOZYAYSTVO: At one time special hopes were pinned on increments for the quality of output and discounts. However, this truly powerful economic commodity-money lever did not lead to a noticeable success. What, in your opinion, was the reason for this?

S. A. Kheynman: To pay additionally, to give increments, to punish with the ruble, and to apply discounts—this was later. At the beginning an attempt was made to solve the problem organizationally. That is why various quality systems appeared: the overall system for product quality control and Saratov, Lvov, and many other systems. To be sure, they were of definite benefit, but did not become widespread, that is, nor did this way give an effect. Now they are not even mentioned. The same happened with increments and discounts. In the last few years we have applied state acceptance on a national economic scale for controlling the quality of output based on the most important products list. Here too everything is contradictory and not simple. On the one hand, the output of defective products, if spoilage is uncovered at early production stages, is checked. On the other hand, this measure is basically administrative,

although it affects economic indicators. Its use distances the producer from the consumer even more, although precisely he, the consumer, evaluates the quality of output and no one decides for him whether certain equipment and a certain machine tool are suitable or not. Therefore, in the establishment of normal economic relations between suppliers and consumers state acceptance plays the same small role and gives just as little as the system of bonuses for a higher quality. Apparently, we do not at all approach the quality problem from this end. It is more global. The most diverse factors are interwoven here. We must begin with their analysis in order to understand what to do.

In order that machinery may be of a high quality, there is a need for machinery that ensures it—dressing, finishing, and lapping—that is, if one can say so, machinery for quality. It is a matter of the structure of the production machine building apparatus itself, a structure in which the material and technical conditions and prerequisites for an improvement in the quality of output are already inherent.

Unfortunately, machine building managers pay little attention to an analysis of the structure of the production apparatus and to the extent to which it contributes to the accomplishment of the task of leading the sector's output to advanced lines. Meanwhile, there are quite objective and expressive, new data. Equipment, including metal-working equipment, censuses were taken in the USSR and the United States in 1983. It turned out from these censuses that in the USSR there were 20 grinding machine tools per 100 lathes designed for shaping metal used in machinery production and in the United States, 66; 4.5 finishing and lapping machine tools in the USSR and 15 in the United States respectively. It is obvious that the gap is very substantial.

PLANOVYE KHOZYAYSTVO: What is the situation in sectors associated with machine building?

S. A. Kheynman: Quite similar. The satiation of rolling shops of ferrous metallurgy with finishing and lapping machinery necessary for finishing and lapping rolled metal surfaces and sections to a high-quality level is much smaller than required. This rolled metal is unsatisfactory. In machine building it is subjected to working primarily by cutting. The proportion of a more advanced metal working method in the form of plastic deformation, as well as others connected with a laser or chemical effect on metal, is very small. In our country there are 16 forging and pressing machines per 100 metal-cutting lathes and in the United States, 24. The lack of worked out organizational and economic relations between metallurgy and machine building also has an effect. Our metallurgy produces most of the metal in the world, but only about 4,000 rolled metal sections. The Klekner Firm from the FRG produces much less steel, but offers its customers by catalogue 10,000 sections—2.5-fold more.

PLANOVOYE KHOZYAYSTVO: Don't you think that a certain connection between the obsolete structure of our production apparatus and the expenditure tendency of management accompanied by a wasteful use of material, labor, fuel-power, and natural resources and a rise in prices of both intermediary and final products is reflected here? For a low quality of labor one has to pay with an overexpenditure of its quantity. Isn't that so?

S. A. Kheyman: This is precisely the point. Mismanagement is not somewhere outside production, but in production itself. The low quality of the means of production and their backward structure—this is waste. For a long time we have been saying that our machines and equipment are much heavier than foreign analogs, which embody the modern world level. We must also see all the rest that is hidden behind this fact: The overexpenditure of metal, which is caused by the low quality of rolled metal and metalworking, has an effect on the entire reproduction cycle. It is necessary to increase the extraction of iron ore, to load transport, which is overloaded as it is, and to expend a vast quantity of electric power on the ore concentration process. In turn, an increase in ore extraction leads to an intensification of the maximum load on nature, withdraws agricultural land from the cultivation turnover, reduces the human habitat, and aggravates the ecological situation in large industrial centers. The backwardness of the production apparatus and its sluggishness and inertia can no longer be tolerated. It is time to change from words to deeds. And if designers continue to offer yesterday's and even the day before yesterday's machinery for placement in production, perhaps it is time to use authority? Although the problem as a whole will not be solved by administrative measures alone. We need a set of measures capable of reorienting metallurgy and machine building to the production of high-quality metal and high-quality machinery from this metal so that machine builders know: If they install a certain part, it will not disintegrate in the assembled machine, because of such metal.

PLANOVOYE KHOZYAYSTVO: Investigating problems of scientific and technical progress, to be sure, you gave thought to what strategy is best to prefer: To seek our own paths, or to follow the beaten paths, in particular, for the purpose of borrowing technological solutions already worked out abroad?

S. A. Kheyman: A balanced approach is needed here. On the one hand, we should not shut ourselves off to foreign experience, but consider and take all the best that has been accumulated by scientific and technical thought. Both contacts and ties are needed. World experience and world practice must not be ignored. On the other hand, it would be a mistake to blindly copy ready technological and organizational-economic solutions. With such an approach our economy will be at the tail end of modern scientific and technical progress. In this sense an overestimation of the role and significance,

for example, of joint enterprises is inadmissible. Counting on these enterprises and only on borrowing machinery and technology elsewhere, the country will not solve its problems. First of all, we need a progressive structure of domestic machine building as the cornerstone of the material and technical base of society. We must search for our own ways and our own techniques and methods of developing productive forces, leaning on all the historical advantages and achievements of the planned economy. This is a serious problem of our economy. We often view it abstractly, in itself. However, this is also a specific problem, which is of great practical and political significance. In practical terms it is connected with the problem of quality of our productive forces and in political terms, with the fact that our country is in the system of world relations and the world division of labor. Two social systems are engaged in an economic competition with each other. These are objective factors. But there are subjective ones. The lack of solution of a number of economic problems, primarily the quality of output and development of scientific and technical progress, has an effect on the course of the competition.

Here it is appropriate to talk about the low competitiveness of domestic technology, machines, and equipment. All developed countries seek to maintain an active balance in the export and import of machinery and try to see to it that export does not exceed import. The export of machinery serves as one of the basic sources of currency earnings for them. In our country, however, a negative balance in the export and import of machines and equipment has existed for 2 decades. According to the statistical yearbook, it is not difficult to estimate that in 1970 it totaled 1 billion rubles, in 1980, 7 billion rubles, and in 1986, 15 billion rubles. As a result, the export of machinery does not give an excess of income from export over expenditures on import and sources for covering import have to be sought in fuel and raw materials. This is by no means a progressive structure of the foreign trade balance. We must also pay for it with an increase in expenditures on petroleum and gas extraction, worsening of the ecological situation, and so forth. This is the form which, ultimately, the lack of solution of the problem concerning the quality of machine building output takes.

PLANOVOYE KHOZYAYSTVO: Does it not seem to you that we have begun to talk more often about the need for structural shifts, but have not yet applied proper efforts and do not make a profound analysis of the state of productive forces, characteristics of leading tendencies, prospects for their development, and appropriate organizational and economic forms?

S. A. Kheyman: Insufficient attention is still paid to an analysis of the material prerequisites for what occurs in the economy. We do not sufficiently study how the dynamic structure of society's productive forces is formed and what the leading tendencies are here. Therefore, the adopted decisions on a territorial distribution of

industries, structural maneuvers, and the most important reproduction proportions are not always optimal. But the main role in their development and substantiation belongs precisely to central planning bodies. Various kinds of expenses and intensification of departmentalism and localistic tendencies are the consequences of insufficiently thought-out planned decisions. This has a negative effect on the solution of problems concerning the distribution of productive forces in certain regions and improvement in the structure of the national economic production apparatus, in particular, intersectorial relations between metallurgy and machine building.

The essence of the problem is exemplified with special clarity by metallurgical miniplants with an annual capacity ranging from 250,000 to 500,000 tons of metal products for machine building application. As an analysis of the tendencies and patterns in modern scientific and technical progress shows, such miniplants are some of the most promising forms of organizational and economic interaction of metallurgy and machine building. Rolling mills of a large capacity and productivity are gigantic machines. It is difficult to switch them from one type of rolled metal to another. They limit the assortment objectively. Huge rolling mills for 5 to 7 million tons of rolled metal are unable to provide a multithousand number of sections. Giants simply do not manage to fill specialized machine building orders and do not possess the required flexibility and capacity for restructuring.

The way out was found in miniplants. They are highly automated, specialized, technically and technologically modern enterprises, which are easily readjustable from one rolled metal section to another. About 300 metallurgical miniplants now operate in the West. We have adopted a decision on the construction of only three such plants. In reality, two were built—in Moldavia and Belorussia. They were not yet fully operative when localistic, unhealthy sentiments were revealed. Ecology was chosen as the pretext. This is how people think: Let them operate somewhere in the Donets Basin, or somewhere else, where the ecological situation is complicated as it is, and deliver finished rolled metal to us. Of course, the ecological factor must be taken into account. However, we should not be concerned about moving advanced technical and economic structures, as ecologically dangerous, farther away from us, but about making them ecologically acceptable. The ecological safety of production is also the main path of its development. We must not turn off this road, but follow it firmly and steadily.

With regard to problems of improving the structure and quality of the production apparatus, they should be solved along the line of the general scheme for the development and distribution of productive forces, not along the line of so-called "republic cost accounting." We must systematically engage in an analysis of the material and physical base of technical and structural progress. No organizational decisions, reorganizations,

shifts, and so forth will replace, for example, finishing equipment if it does not exist. That is why the mechanism of increments and discounts did not work as expected.

PLANOVOYE KHOZYAYSTVO: Have you noted that, recently, intensification has been mentioned less and less frequently and more and more quietly? Even this word itself is left out of the vocabulary of scientific publications.

S. A. Kheynman: Unfortunately, this is so. With respect to intensification, ebbs and flows are noticeable. But a fundamental position is needed here, because the entire essence and interweaving of all problems—concerning production organization, scientific and technical progress, and the economy as a whole—lie precisely in intensification now. It is a matter of our growth, but at the expense of the potential, volumes of raw materials, and capacities of the production apparatus that we have at our disposal. The mentioned Klekner Firm produces highly efficient rolled metal sections, while our metallurgists are proud of the fact that they have ensured an increase in *ordinary* metal. And they see almost an intensification in this.

PLANOVOYE KHOZYAYSTVO: If we also analyze the economic aspects of the problem, the following paradox is revealed: The consumer of machine building products not only fails to restrain the rise in their prices, but appears even as a kind of conductor of a price rise with regard to allied enterprises. What are your views in this connection?

S. A. Kheynman: Here we approach theoretically more general, but no less important, problems. In my opinion, the criterion of socialization in its Leninist concept has not yet been fully realized. In practice, production socialization presupposes efficiently organized and universal control and assessment of real labor results and expenditures. This can be attained only within the framework of nationwide labor cooperation and a correct intersectorial interaction of primary economic links. Society should be oriented toward reducing not merely departmental and sectorial labor expenditures, but national economic and socially necessary labor expenditures. However, this requires the solution of problems concerning the specialization and concentration of industry and agriculture. Their solution is not an end in itself, but a means for the organization of correct intersectorial relations between producers and consumers of products. After all, it is important not to merely produce, for example, a good machine tool. Something else is the chief thing—it should fit the consumer's "figure," occupy the place in the production structure preassigned to it, and ensure a real economy of live and past labor.

Unfortunately, however, we now observe a completely different approach. Enterprises are only interested in their own production and in their own efficiency. Ministries demand the same from them: gross production, a

value plan, a quantity plan, a profit plan, and an assortment plan. But it makes no difference to them whether consumers are satisfied with delivered products and at what price and how needs are met. Producers' omnipotence and a lack of consumers' rights exist.

However, consumers are also in the value system of management coordinates. It would seem that, if they acquire a less qualitative, but more expensive, machine tool, their profit should be reduced. This is logically correct and indisputable. In practice, however, this is not so. That is why. The higher expenditures on such a machine tool are calculated in the production cost. It is approved and becomes the base for the price of produced products. There is an increase in prices in the link of the machinery consumer. The consumer is also oriented toward "gross output" and an increase in value volumes. He is interested in the rise of prices of "his" products. Prices cover wasteful expenditures. The price rise is effected from link to link by contractual cooperation. Although prices rise, neither the profit of the supplier nor of the recipient of machine building products not only fails to decrease, but can even increase. Prices, which cover actual expenditures, are a kind of umbrella covering shortcomings in management, waste, and mismanagement. Under such conditions neither the supplier nor the consumer is interested in restraining the price rise. For this reason increments also did not prove worthwhile.

And another reason. The following example gives an idea of it: In the Transcaucasus there is a plant producing very small lathes. But they are of a low quality. Consumers do not take them. Consequently, the plant should "go broke." It should, but it does not "go broke," because the Ministry of the Machine Tool and Tool Building Industry compensates for the reduction in its volumes through an increase in volumes at advanced plants. In one place 1 million rubles are eliminated from the plan and in another, are added. V. P. Kabaidze said correctly at the 19th party conference: We still love the lame and the destitute. The low quality of output of some is covered with the high quality and result of others. Plans are considered fulfilled everywhere and, most important of all for the ministry, in the entire sector. Thus, a backward plant disguises itself, makes itself appear successful, and puts on some rouge.

PLANOVOYE KHOZYAYSTVO: What do you think, why in advanced world practice associations are established after intersectorial specialization, but in our country, before it? Apparently, this is also a significant factor affecting the quality of output?

S. A. Kheynman: Such a situation is connected with the general problems concerning the structure of machine building. Highly productive specialized and unified production of functional assemblies and units is organized at small and medium-size machine building plants in developed countries. In time every assembly is finished to the highest level of perfection and quality. On the

basis of production specialization and cooperation a high standard of the entire machine building production is formed and skilled personnel are established. At the same time, machines and equipment are assembled from these ideally finished units at other plants. In our country the plant makes all the assemblies for itself. This is incorrectly understood socialization of labor based on its weak division and on cumbersome and by no means modern item specialization, which becomes obsolete on account of the poor quality of products. However, both our science and economic planning practice have ceased even to talk about the development of socialization along such paths. But not mere talk is needed. Without part specialization there is no unification of assemblies and without it it is impossible to bring them up to the world level of quality and to raise the standard of production and personnel skills. Such is the connection here.

In order to solve the problem, it is necessary to establish, I would say, a machine building infrastructure. There is a need for a network of specialized enterprises producing functional units for all machine building so that other plants may only assemble quality machines and equipment.

PLANOVOYE KHOZYAYSTVO: Thus, a unit-module organization of this business, which makes it possible to assemble functionally different machinery from units and modules finished to perfection, varying them?

S. A. Kheynman: Yes, like different pictures from blocks, that is, a flexible production structure is needed. Flexibility is the first condition for progress in machine building. It requires the selection of functional units, a high level of unification, and their specialized production connected on a cooperative basis. We must strive for this. But in the meantime in our country unification is at an exceptionally low level. The Moscow Motor Vehicle Plant imeni I. A. Likhachev and the Gorkiy Motor Vehicle Plant manufacture trucks of approximately the same category. The degree of their unification is extremely low—it does not reach even 5 percent; at the enterprises of the former Ministry of Tractor and Agricultural Machine Building, 6 or 7 percent. This is one of the consequences of the departmental—pardon such a sinful expression—private economic, by no means socialist, approach at socialist property enterprises.

PLANOVOYE KHOZYAYSTVO: In such a situation, apparently, it is difficult to organize the activity of a real, not declared, intersectorial association. If there is no technological part specialization and cooperation...

S. A. Kheynman: Quite correct. For example, in Western Europe all motor vehicle industry enterprises receive cardan shafts (for passenger cars) from England.

PLANOVOYE KHOZYAYSTVO: But, for us this is a big question, although, it would seem, in such a country with public property, which, incidentally, sometimes is considered ownerless (someone should also shake this foundation

of ours!)... In this connection does the decentralization of capital investments not lead to a dissipation of efforts and resources in the process of innovations?

S. A. Kheynman: This is one of the central and as yet very poorly solved problems concerning presently formed relations of independent enterprises and the economic center, especially planning bodies. Frankly speaking, there have been distortions in this matter. Now there is enthusiastic confidence that full cost accounting and self-financing are a panacea against all evils. It stems from the loud statements and promises of a good life for enterprises. It was assumed that all of them would do everything that was necessary. Gosplan was represented as a carrier of conservatism. Hence the dissipation of resources, especially capital investments. A profound mistake! It is fraught with serious consequences for technical progress and for the social and economic development of the country as a whole. An enterprise is unable to solve structural problems on its own. Nor can it establish a machine building infrastructure and a network of specialized production facilities producing functional units.

Of course, many unpleasant emotions are connected with the work of planning bodies. They make considerable mistakes and miscalculations, but try to do without miscalculations in a big endeavor. It should not be a matter of belittling the role of these bodies and limiting their effect and responsibility for the state of the economy, but of improving the nature of their work.

PLANOVOYE KHOZYAYSTVO: How do you see this? To improve the methodology and methods of planning?

S. A. Kheynman: If a person has been in a plaster cast for a long time, even after it is taken off it is difficult for him to move on his own at first. Our enterprises were in the plaster cast of all kinds of instructions for a long time. Now independence has been granted them. However, it can hardly be expected that they immediately stand on their feet and begin to move ahead confidently. They need the support of planning bodies. The rest, which has just been discussed, is the most harmful illusion fraught with big losses and disappointments for all society. Intelligent help is needed on the part of planning bodies. However, some planning workers would often say even with some dignity, if not scorn: We will not establish contact at enterprises! But how to analyze economic processes, to control plan fulfillment, and to observe new phenomena? And what is the Gosplan without this?

Enterprises themselves cannot competently engage in the study of tendencies in scientific and technical progress. Moreover, they are not trained to do this. However, if we want scientific and technical progress to develop under conditions of the expanding independence of enterprises and self-financing, it is necessary to establish an all-Union information network of scientific and technical progress.

PLANOVOYE KHOZYAYSTVO: Which would also serve as the initial data base for planning at enterprises?

S. A. Kheynman: Precisely so. The prospects for the development of planning are connected with the establishment of such an information file. It is necessary to teach enterprises to use it so that they may turn to it independently and with interest. We have in mind not a mere cost-accounting mediation between the supplier and the consumer... In some offices, even budgetary ones, where there is nothing but paper, there is a game of cost accounting with only one objective, that is, to obtain more (but even grass does not grow there), whereas in shops, where there is a place for it, it does not exist. Thus, a centralized initial data bank for planning is needed. The entire national economy needs it now.

Thus, if to sum up the investigation of this matter, the role of planning bodies increases not in the sense of planning every small bolt and screw, but in the sense of a profound analysis of the tendencies in and prospects for scientific and technical development of productive forces. The solution of problems concerning structural and organizational shifts in the economy is required from them.

The independence of enterprises is not an end in itself. A combination of the efforts of the center and low-level links is required and a unity of actions, which now is disrupted in something, is needed. When they work for one common cause together, success comes. The country's entire historical experience attests to this. Every decision of planning bodies should not be seen as interference in the affairs of enterprises, undermining of their independence, and so forth. The tasks and interests of the country's social and economic development are not divided into stories [of a building].

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Goskomtsen Deputy Chairman on Pricing S&T Products

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[Article by L. Rozenova, deputy chairman of USSR Goskomtsen: "Scientific-Technical Progress and Pricing"]

[Text] Lenin's words were never so relevant as today to the effect that "he will win out who has the greatest technology, organization, discipline, and the best machines."¹ Technical progress and the term "better machines" are dynamic criteria. Economic efficiency and their relation to world achievements have now become the terms in which they are measured. Only reliance on science makes it possible to perform these tasks and to create new generations of highly efficient and competitive equipment.

There is no doubt that the growth rates of scientific explorations must be higher than the growth rates of their practical application in the economy. At the same time, it is an exceedingly important task to speed up the embodiment of scientific and experimental developments in actual fabrications. Only with this approach will the new technology accepted for production be able to meet or exceed in its technical level the best world achievements.

The introduction of negotiated prices for the scientific-technical product, which took effect beginning in 1987, and the related enhancement of the role and responsibility of both client and developer for its technical level, competitiveness, and efficiency and for reduction of the time and cost of creating new equipment, processes, and materials were aimed at achievement of high final results. The conversion of scientific organizations to cost accounting and self-financing will help to strengthen their economic motivation to raise the efficiency and innovativeness of technical designs.

It is especially urgent to work out specific recommendations for the determination of contract prices in connection with improvement of cost accounting (*khozyaystvennyy raschet*) in scientific organizations. Here, the essential thing is to select approaches to pricing so that the price motivates organizations which design equipment and processes to operate efficiently and motivates consumers to apply what they have produced. The introduction of contract prices for the end product of the activity of NII's [Scientific Research Institute], which is recognized as a commodity (research, design, mechanical engineering, and process engineering jobs and services), means that the product possesses use value and the relation between science and production takes the form of a "purchase-sale" transaction. The economic benefit from developing and applying the scientific-technical product serves as the quantitative measure of use value.

Accordingly, the prices of the scientific-technical product are also determined as a function of its efficiency and quality. At the same time, its economic benefit and the sphere in which the latter is received depend on the type of development and the specific way in which it is used. For instance, the benefit from applying and creating a new process may be realized by the customer himself (purchaser). In this case, the contract price is set in terms of the share of the scientific organization in the total benefit from such developments, i.e., the price depends directly on the size of the economic benefit received in connection with applying the new process.

But if developments of new designs of machines and equipment are in question, then when they are used by those who had them developed, they afford a benefit only in the next sphere of application of the new equipment thanks to improvement of its performance characteristics. As a rule, the actual purchaser of the design incurs additional costs in manufacturing products which

represent new design developments with a higher technical level and quality. In other words, realization of the benefit is separated in time from the "purchase-sale" transaction involving the design development.

It is equally complicated to take the benefit into account in the contract price when new structural materials are being created because the benefit from their application may be still more remote in terms of stages of production. The benefit emerges directly during operation of the new equipment manufactured using the materials newly put into production.

Since it is complicated to register in contract prices the real benefit that is removed in time over the stages of development, production, and application of the scientific-technical product, some economists propose renouncing methods of determining them which are based on the economic benefit and switching to a structure of the contract price based on costs (estimates) to which profit is added in the established proportion. In our view, this detracts from the responsibility and motivation of R&D organizations to increase the efficiency of their developments and to obtain high end results at the lowest cost. After all, intensification of scientific activity is a very urgent problem at present.

Developers and customers should apply much higher standards to the substantiation of the size of the economic benefit from the scientific-technical progress and to methods of predicting it. The customer is taking a certain risk when he pays for its calculated size in the contract price, since that calculated value could differ substantially from the actual benefit of the new product when it has been put into production using the new developments. But the contract may envisage conditions of mutual responsibility for attainment of the agreed benefit.

The customer, who is manufacturing a product on the basis of new developments must prove its efficiency to the consumer when contract prices are being negotiated and must as a minimum offset his costs, including the expenditures to acquire the design.

As shown by the experience of a number of branches, the greatest effectiveness in terms of obtaining a real savings may be assured by long-term direct relations with developers in which the fullest use is made of their scientific-technical potential and the integration of science with production is reinforced. The main thing now is to speed up the process from the idea to manufacture of the product along the entire chain: applied science—experimental design and development—installation of the new process or organization of the production of the new equipment—and application. There is no question that the use of contract prices determined according to the efficiency of the development is aimed at performing the

task of speeding up the application of scientific results. These prices must become widespread, above all in that segment of applied science that is oriented toward the economy.

What economic mechanism combines development of new products with improvement of their performance characteristics? For a long time the creation of new machines and equipment in the USSR has involved setting the maximum level of limit prices so as to take into account the change in performance characteristics and quality. Technical-and-economic substantiation of development of new equipment is the initial stage of its design. This verification of design features so as to take into account their economic efficiency is an indispensable condition for developing a new product and putting it into production in all the advanced countries of the world.

In undertaking to design and develop new products the departments and laboratories of concerns and firms as a rule obtain an assignment to create a new product which has definite technical-and-economic parameters and a set price. Setting the price is influenced by the potential demand for the new product and by the benefit which the consumer can realize in using it. The developer tries to "fit" the production costs into that price at the intended (in view of demand) volume of output and to obtain sufficient profit. When the objective is set this way, the search for progressive design features and development of economical technology are indispensable.

NIIs, KB's [Design Bureau], and enterprises in our own industry face the same tasks. The strategy of acceleration signifies not only acceleration of the process of creating new technology and putting it into production, but above all raising its technical level and efficiency at the lowest cost. As experience has shown, as much as 80-85 percent of costs are incurred in designing new products and selecting the technology for their production. It is in these stages of the creation of new equipment that its size, the materials used, the processing methods, and so on, are determined. The other 15-20 percent of costs may vary in the actual production process itself. In other words, most of the costs are incurred in the design phase of new equipment.

Recently, an energetic effort has been made to strengthen the role of prices in creating economical models of machines that guarantee a high benefit during use and a higher profit in production. Contract prices for scientific-technical developments that conform to their efficiency and the transition to a new price model will help to solve this problem. The fundamental thing about the new model that makes it distinctive is that it is not the sum of costs and profit that determines the price, but, the other way about, the price, calculated as a portion of the useful benefit from improvement of the product's performance characteristics, that influences the level of that sum.

The price's direct dependence on improvement of the product's performance characteristics does not mean that it takes into account only the usefulness of things, while costs are ignored. It would be incorrect to suppose that the social value of machines and equipment is determined by the conditions of their application. The economic basis of the price has been and remains the socially necessary expenditures to produce the product. In Marxist-Leninist theory the price has no other economic content.

The magnitude of the value of commodities, as is well-known, is determined by the quantity of labor embodied in them, and this is characterized by the socially necessary worktime. Going a step further, "the socially necessary worktime is that worktime which is required to manufacture a particular use value under the existing socially normal conditions of production and at the level of skill and intensiveness of labor that is the average in the given society."²

Every customer evaluates the use value of machines and equipment above all from the standpoint of meeting his own need and in view of the technical-and-economic parameters and quality of that equipment. At the same time, the totality of the performance characteristics cannot be measured in physical units (tons, meters, pieces, etc.). The price can be compared to the performance characteristics only in value form: in particular, when they are expressed in the form of the useful benefit. By the useful benefit we mean the estimated value of changes in the performance characteristics of the new product taken altogether.

Two standards have been established for determining wholesale prices in view of the average relations between costs and results that have taken shape in practice in recent years: 0.3 as the guaranteed portion of the useful benefit that is redistributed to the consumer, and 0.7, which goes to the manufacturer. This will make it possible to establish more rigid linkage between the additional costs and the improvement of the new equipment's performance characteristics. The social usefulness of any unit of machines and equipment should figure as the economic criterion of the additional costs.

The only costs which are given social recognition through the price are those whose level corresponds to the established standard, which reflects the socially normal conditions of production. Higher manufacturing costs, exceeding prices adjusted so as to take into account performance characteristics and a portion of the useful benefit, cannot serve as the basis for setting them at a higher level. This guarantees the consumer a benefit thanks to the reduction of unit costs during operation of the new technology and establishes an upper limit on the price for the producer.

At the same time, the temporarily higher costs related to putting new equipment into production (the costs of preparation and organization of production, the introduction of progressive technological processes, etc.), are

compensated from other sources, in particular from the fund for development of production, science, and technology. By their economic nature expenditures to put a new product into production are a portion of the socially necessary expenditures and are therefore subject to reimbursement from social funds formed by branches and in enterprises.

Scientific-technical progress is speeding up the period of obsolescence and replacement of generations of machines and machinery. In order to remain at the level of present-day requirements, the product has to be constantly improved and updated, without waiting for obsolescence. Since products for production and technical purposes are still being updated at a slow pace, additional steps have been taken to strengthen the economic pressure which prices exert toward prompt removal of outdated products from production and their replacement by more efficient products.

The new pricing principles envisage that in calculation of the useful benefit of new technology, the price of the latter is adjusted by applying the coefficient 0.9 to the base price, this coefficient taking into account its obsolescence over the period that the new product is developed and put into production. This coefficient stands in the way of organizing the production of equipment with low efficiency.

The transition to improved methods of determining wholesale prices makes it possible for their levels to take into account the efficiency of the production and application of new equipment and to abandon the practice of establishing incentive supplements to wholesale prices with temporary validity and a special distribution procedure, especially since in the context of self-financing there is a uniform normative approach to distribution of profit realized. The new procedure instills a motivation first of all to create highly efficient equipment at the lowest cost for retooling the economy.

In connection with democratization of the pricing process, as of 1 January of this year the rights of enterprises and associations were essentially broadened with respect to setting contract prices for a new product during the period before its production is brought up to rated capacity. But setting prices by agreement between the parties does not mean that they can be determined on the principle of "whoever is stronger" or that they can depend on the manufacturer's dictate. A uniform technology and the established standards are used in arriving at contract prices. First, in the machinebuilding sector they apply only to new machines and equipment on a list defined by the USSR State Committee for Prices. The list includes highly efficient and as a rule end-use products (waste-heat boilers, machining centers, machine tools and forging and pressing equipment with NPC, rotary lines, etc.). Second, contract prices are set for a definite period of time—not to exceed 2 years, after which the wholesale prices are included in the price list. And third, according to a uniform methodology that puts

a limit on their maximum level, so as to guarantee efficient application of the new equipment because its useful benefit has increased faster than its price.

The 2-year validity is interlinked with intervals for product certification. The present certification procedure provides that the technical level and quality of new technology are evaluated according to the results of its use over a period of 1-2 years and the consumer's conclusion concerning the actual indicators of performance. After the end of the validity of the contract prices, list prices will be linked to the results of product certification in the superior-quality category, and deductions are applied if the products are evaluated in the first-quality category. What is more, the use of contract prices will make it possible to improve the objectivity of the verification of the real benefit to the consumer of the new technology on the basis of results of its operation over a period of 2 years and also the manufacturer's production costs.

Most of the criticism of pricing has been related to the hiking up of the economic benefit and the consumer's low level of responsibility for the benefit agreed to. The new approach to pricing we have been discussing and the broad introduction of contract prices make the consumer (customer) more responsible for the soundness of calculations, since the price level will depend directly on the size of the useful benefit.

Up until 1988 contract prices were applied to a limited range of single-or special-purpose products. A check showed that there was a fixed pattern in operation: if the product's actual profitability did not depart from the standard, it was considered substantiated. But this cost approach must not be applied in analyzing justifiability. In the new price model its level would depend solely on improvement of the product's performance characteristics, and no restrictions on the profitability of production would be envisaged. If the new equipment is highly efficient in operation (taking into account reduction of its materials intensiveness and labor intensiveness) and if it has been manufactured at the lowest cost, then the profit realized in its production may be substantially higher than the standard.

On the whole, additional measures to improve and democratize pricing are aimed at a radical change in the customer's role in this process and toward creating more favorable economic conditions for enterprises putting into production new generations of technology.

The broad introduction of contract prices has given an edge to the question of utilization of new technology. In the economics literature there has not been enough treatment of the use of machines and equipment, even though their economic efficiency largely depends on operating conditions. In many sectors the use of equipment is extremely inefficient. For instance, according to figures of the USSR People's Control Committee, at enterprises of the electrical equipment industry highly

productive machining centers are not fully loaded; some of them are simply standing idle. At many enterprises of Minselkhormash and Minenergomash the shift coefficient for the operation of machine tools with NPC [Numerically Programmed Control] is less than 1.

Organizing the production of a scientific-intensive product involves a substantial rise in its production cost. This is a process that has justified itself in all the advanced countries of the world. Putting the most recent technology into production is the most economical strategy of technical progress, and it is important that our domestic machines and equipment not fall short of the best world standards, but attain a higher technical level and quality.

If the average wholesale price of a universal metal-cutting machine tool is 5,000-10,000 rubles, then a machine tool with NPC will be 65,000-80,000, and that of a machining center 120,000-200,000 rubles. Given this relationship in wholesale prices, every hour of downtime of a machining center costs the customer tenfold more than an ordinary universal machine tool, and present-day equipment, which is more expensive, is utilized efficiently when it operates on 2-2.5 shifts.

The consumer bears practically no economic liability for underloading equipment. For example, even though the stock of mine transport equipment has been replenished with highly productive machines with a large capacity, at a number of enterprises of USSR Mintsvetmet their output has dropped in recent years because of the extremely unsatisfactory utilization. The question arises: Who is responsible for the fact that the raw materials, supplies, components, and intermediate products and the work of designers, process engineers, and workers expended to create that equipment are not bringing society a return?

The new procedure for financing capital investments will help to increase the efficiency of utilization of machines and equipment. In the context of full cost accounting and self-support the principal source for financing outlays for reconstruction and retooling of production will be the enterprise's profit. It will be disadvantageous for it to acquire expensive equipment with those resources and then to let it sit idle.

At the present time, the problem of efficient use of equipment has become particularly acute. Our country possesses an immense stock of machines and machinery. Economists have calculated that a rise of just 1 percentage point in the efficiency of utilization of fixed productive capital would yield an annual saving of about 10 billion rubles. In addition to increasing the shift coefficient of the operation of equipment, a set of measures must also be drafted to improve the load on it during the shift. Downtime lasting less than a shift and related to shortcomings in the organization of production, the absence of supplies, parts, and tools, or unscheduled repairs also detract from the efficiency of operation of the stock of machines.

In a number of cases the technical capabilities of machines are underutilized because the machines are not used in an integrated way. For instance, the PO [Production Association] "Ivtekmash" has since 1983 been manufacturing the highly productive Model AKD-2 machines for dyeing cotton thread, wool fiber, and ribbon, but the new dryers that are supposed to work with those machines have so far not been put into production. Consequently, at a number of factories the anticipated benefit was not achieved, but rather there were additional costs because of introduction of the laborious manual operation of moving the spools. But what is surprising is that neither light industry nor the machinebuilding industry is really alarmed by this situation. In 1986 the consumer confirmed the wisdom of awarding the Quality Emblem to the dyeing machines (which in themselves deserve a high opinion), but he did not demand faster organization of the production of the up-to-date dryers essential to obtaining a return from the new dyeing machines. Quite often, when equipment is not used for its particular purpose, it is the customer's fault that the efficiency of the new equipment is not achieved.

Raising the efficiency of machines and equipment is being held back by the existence of above-allowance stocks of installed equipment and also equipment that has been delivered for installation, but has not been put into operation. The low rates of attainment of capacity, when so-called new construction projects fail for years to reach the rated volume of output, have an extremely adverse effect on the efficiency of new technology.

Thus, the efficiency of machines and equipment should be managed through all the stages of their life cycle: design—production—application. The income of design and development organizations and of enterprises manufacturing and consuming them depends on the kind of costs and results that occur in each of these stages.

In the context of cost accounting and self-financing the problem of the product's profitability and of guaranteeing optimum stability and flexibility of prices is becoming particularly acute. The establishment of contract prices and changing the level at which they are included in the price list so as to take into account the actual benefit from applying the product will make them more flexible. Combining price stability and price mobility (in the interval between general revisions), i.e., combining their planning and record-keeping functions and their function as an incentive, has always been a complicated issue in pricing. On the one hand stability guarantees the robustness of plans, while on the other effectiveness in applying prices as a value lever to stimulate technical progress is incompatible with their remaining unchanged for a lengthy period of time, especially in the context of self-financing.

High profitability of products put into production in the past must not hold back new developments. It is intolerable for the real income of work collectives to be

safeguarded thanks to products put into production earlier. Contract prices in effect for no more than 2 years motivate the manufacturer to update products and to improve their technical level and quality.

Until recently no complete solution was provided for the problem of prompt updating of prices and price flexibility. So-called stepped prices, prices reduced only for the manufacturer, price deductions, etc., have had limited application, since they involved recomputation of planning targets. Price review involved a laborious effort to make adjustments in plans on the basis of balance sums of the change in the manufacturer's proceeds and the saving (or additional costs) to the consumer.

In our view, price changes should be "emancipated" from mandatory adjustments of planning targets. If high profitability of an old product has been keeping new machines and machinery from being put into production, it would be advisable to lower their prices without adjustments of the plan and to correspondingly guarantee the economic profitability of the enterprise in producing the most up-to-date technology. Possibly, the maximum profitability will have to be determined for certain product groups at the end of their period before obsolescence when that profitability is reached, prices would be dropped, and this would not be taken into account in the plan.

The state order was incorporated into planning practice as of 1 January 1988; it envisages a direct order to production associations and enterprises to manufacture the most important products to meet the paramount needs of society. There have to be economic incentives to manufacture products over and above the assignments contained in the state order, especially those products which are very scarce. Wholesale prices have a large role to play in the performance of this task.

The USSR Law on the State Enterprise grants production collectives the right to independently dispose of products manufactured over and above the plan as well as products which have been refused by consumers or material and technical supply authorities that concluded a contract for their delivery. Enterprises would do this themselves exclusively at the wholesale prices in effect. On behalf of state regulation of product deliveries in the context of the development of wholesale trade in means of production, commercial prices are being set on products which, though not new, are scarce and are manufactured over and above the state order.

The additional profit realized in the production of such products will on the one hand give the manufacturer greater motivation to increase their output, while on the other it will offer an opportunity for consumers who have additional resources they have earned to "turn them into commodities" through the trade in scarce products bypassing the system of allocations of stocks, which they would use for retooling and reconstruction. In addition, the application of higher prices will promote

conservation of scarce resources and their optimum utilization. Regional authorities of USSR Gosnab have been granted exclusive right to apply the commercial prices.

As is well-known, enterprises in a number of branches will now receive their supply of materials and equipment through wholesale trade. Scientific research, project planning and design, and process engineering organizations have also made the transition to this progressive form of service; their prompt supply of various materials, instruments, components, and other products (though in small quantities) has great importance, especially in preparing the production of experimental prototypes and the first production runs of new equipment. As wholesale trade expands, prices must also be made more flexible.

Wholesale trade, especially in those products which are in balance, will make it possible to bring the volume of their production up to the level of the economy's actual need and liberate additional production resources as well as enterprise capacity to manufacture those products for which the need has not been fully met. In this case, price flexibility must operate so that if production of certain products is excessive at present price levels, then the prices of those products must drop, without this being taken into account in the plan and without the adjustment of economic norms. The loss of profit must be compensated to manufacturing enterprises by virtue of the increased output of scarce products and from the additional income obtained in putting highly efficient new products into production. The reduction of prices of products for which there is no shortage will help to improve the structure of production and to make the economy healthier.

The introduction of contract prices and commercial prices and the reduction of prices of outdated products will make prices more flexible. Thus, optimum pricing flexibility is one of the most important factors influencing the motivation of enterprises to update products, to raise the product's technical level, quality, and efficiency, and also to improve the production structure so as to take into account the needs of society. If prices should in fact be left unchanged for a long time, then they will inevitably become outdated and instead of an economic incentive for scientific-technical progress, they may become a brake upon it.

The change in the actual profitability of products is not the only sign that prices have become out-of-date. Certain calculated elements in their original structure become "old," there are changes in the socially necessary costs, in the capital intensiveness of products, and these changes moreover occur at unequal rates.

Experience shows that it is not possible to solve all these problems in the process of current pricing. Mere adoption of partial changes cannot essentially reduce prices, nor can it improve their relations for individual groups

and products. What is more, when sizable adjustments are made in the current wholesale prices, a danger arises of disrupting correct price relations of certain models of products of the same type or products belonging to a single parametric series.

That is why improvement of the price system is possible only with a blanket revision. The main principles of the radical restructuring of management of the economy adopted by the June (1987) Plenum of the CPSU Central Committee outlined a radical reform of pricing during which all types of prices and rate schedules must be reviewed in an integrated fashion. Prices must be turned into an effective instrument for increasing the efficiency of social production, for developing economic methods of management, and for deepening cost accounting and self-financing. They must be the economic foundation for the restructuring of management of the economy.

Price reform is one of the key problems in radical improvement of the economic mechanism; the results of the economic methods of centralized guidance, acceleration of scientific-technical progress, and increasing the efficiency of social production depend to a definite degree on how it is solved. The fundamental feature that distinguishes this reform is the interlinked change of wholesale prices, purchase prices, retail prices, and rate schedules as a unified whole. This must result in the creation of a qualitatively new price system.

The main directions of the restructuring of pricing follow from the requirement that prices consistently reflect the socially necessary expenditures of labor to produce and sell the product and its performance characteristics and efficiency, fuller appreciation of the charge on labor resources and natural resources, and also outlays for environmental protection. The price system must by its nature be a cost-fighting system, must become an objective standard by which to measure costs and results of economic activity, and must create economically sound conditions for increasing the effectiveness and intensifying cost accounting and self-financing in all sectors of the economy. The new wholesale prices and rate schedules in the industrial sector are to be put into effect as of 1 January 1990.

A most important stage of the reform is to improve wholesale prices of the products of machinebuilding. Since many machines, equipment, and instruments do not have productivity, reliability, precision, and materials intensiveness to meet the progressive achievements

of science and technology, are uncompetitive, the prices of this technology must be reduced or maintained at the present level in spite of the higher cost of raw materials, supplies, fuel and energy, as well as the adoption of new and higher rate schedules of deductions for social insurance. These "strained" prices must promote removal of outdated products from production and must clear the way for new technology, whose prices will take into account the benefit from their application.

Consumers have filed particularly significant reproaches concerning the quality and reliability of agricultural equipment. When wholesale prices of this equipment are revised, it is a most important task to evaluate the real performance characteristics and to maintain the price level; performance of that task must contribute to equivalent exchange between industrial products and agricultural products.

The main direction in improving wholesale prices of machines and equipment is to construct them as a function of the equipment's performance characteristics and quality. At the same time, the use of standard value estimates of the product's parameters and of price relations based on its performance characteristics makes the issue of differing rates of product profitability more acute. If we get away from recording individual costs and if the price objectively reflects the technical level and quality of the product, enterprises manufacturing outdated equipment will experience losses of profit (cost-accounting income), wages, and social benefits. According to calculations of USSR Goskomsen, the share of products with low profitability, which are produced at a loss, products whose production costs are not in line with their quality, will increase 20-30 percent when the new wholesale prices are put into effect.

It is an indispensable measure to develop and adopt a new price system for the products of machinebuilding, a measure that will help to perform the tasks of accelerating scientific-technical progress.

Footnotes

1. V.I. Lenin, "Poln. sobr. soch." [Complete Works], Vol 36, p 116.

2. K. Marx and F. Engels, "Soch." [Works], Vol 23, p 47.

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Decrease in Number of Workers in Applied Research Predicted

18140174 Moscow PRAVDA in Russian 28 Feb 89 p 3

[Letter by Candidate of Technical Sciences V. Dubrovskiy under the rubric "From the Mail of the Science Department": "One Ought Not to Start From Scratch"]

[Text] The present universal and simultaneous change-over of science to cost accounting is fraught for it with large losses. Up to now scientific research was paid for mainly from the state budget, therefore, industry ordered much out of habit or for decoration. Now it will order the minimum necessary.

On the other hand, the economic stimuli of progress in heavy and medium industry are minimal. Hence, in the next 3-5 years the orders will be intended for instant use. During this time the promising directions in science, which have been left without financing, will simply disappear. And when a need appears, we will start from scratch and will spend time and money all over again.

It must be noted that now in our country the number of people employed in applied research is disproportionately large (about 25 percent of the world number). It is clear that so many applied scientists are not needed for the present—and future—level of development of industry.

Thus, for a large number of reasons it is possible to assume that an outflow of manpower resources from applied science is inevitable.

But this outflow should be organized so as to ensure the continuity of promising directions and to increase the labor productivity of the remaining personnel. Moreover, it is necessary to use to advantage the knowledge and experience of the people leaving science.

It will be impossible to ensure such a development of events by present administrative methods. So that the superfluous people would leave applied science naturally, it is necessary to ensure the strict connection of the quality and quantity of labor and the novelty of the results with the remuneration.

Today we do not have methods of evaluating the quality and quantity of scientific labor. But under the conditions of the continuing dictation of the producer one must also not count on "natural selection" during the competition for orders.

For the solution of this problem one should: introduce cost accounting at scientific research institutes 1-2 years after its introduction at plants; during this time to quickly borrow or develop and test in practice systems of the evaluation of the quality and novelty of scientific labor; to introduce in science first "internal," then "external" cost accounting.

Meanwhile, perhaps, the dictation of the state order will weaken and elements of competition will appear, which will increase the possibility of real cost accounting in applied science.

Rewrite, Ratification Process for Draft Patent Law Explained

18410181 Moscow NTR: PROBLEMY I RESHENIYA
in Russian No 3 (90), 1989 pp 4-5

[Interview with V. P. Rassokhin, assistant head of the State Commission Task Force by An. Shakhov: "Feedback is Working Between Participants in the Discussion of the Draft Law on Invention and the Government Commission"]

[Text] ...in the heat of the 10-week discussion of the draft law on inventive activity in the USSR.

A multitude of inventors and scientists, engineers and lawyers have become involved in this almost nationwide discussion. Their comments, opinions, and detailed proposals have poured into the Institute for Government and Law of the USSR Academy of Sciences, where the Government Commission's task force is located these days. Every morning the black limousine of the government courier stops next to the green building on Moscow's Frunze Street with the regular delivery of yesterday's newspaper speeches by participants in the discussion of the draft law on invention, letters on the same topic sent by citizens directly to the USSR Council of Minister's Commission, responses and proposals from public organizations, ministries, and departments. At 10:00 experts seat themselves at the long table which divides the meeting room in half—lawyers on one side, specialists on innovation processes on the other. They brought me questions, submitted in one form or another in current letters to the editor, where public interest is focused on processes of democratization, particularly on one of the most burning issues, feedback.

Only with feedback can a citizen's personal opinion or general public opinion on an issue have an actual influence on decision-making in higher government echelons and on the formulation of new legal acts and norms.

I turn to the assistant head of the Government Commission's task force, V. P. Rassokhin, doctor of legal sciences.

NTR: PROBLEMY I RESHENIYA: I'm confronted with two opinions. I. Stepanov, a literature teacher from Tomsk, asks, "Why should my colleagues and I, or people in general who are far removed from technology and inventive concerns, participate in discussion on such a specific draft law? We have little understanding of what's good, we only confuse things." V. Kuznetsov, an experienced engineer from Leningrad leans, I must note, toward the same way of thinking when he writes, "The draft law on invention pertains to an extremely specific area. Does it really need nationwide discussions?"

What do you think, Vitaliy Petrovich?

Rassokhin: I think that there is such a need. Every citizen, if he is a citizen, must be convinced that he can influence the law-making process, that he can be heard by lawmakers. The law needs his experience—in both work and life.

The fact is that no matter how specific a particular area in which a new legal order must be established, it is not isolated from "the rest of life." We must take into account experience "from out there," from the person who knows little about the specific area of activity for which new legal norms are being developed.

NTR: PROBLEMY I RESHENIYA: Couldn't you illustrate your idea with an example taken from right here—from today's abundant mail to your commission?

Rassokhin: You're in for a surprise. In any case, this mail—and it still contains letters from people professionally far removed from invention—contains no letters written by people who don't understand the issue.

NTR: PROBLEMY I RESHENIYA: It turns out that the topic of the draft law in and of itself selects the necessary participants in the discussion...

Rassokhin: And that's very valuable. It turns out that predicting group of participants who are truly interested and useful is more difficult than identifying them during the course of the discussion.

NTR: PROBLEMY I RESHENIYA: Tell me, can you be certain that any letter, article, response, in other words, every opinion voiced will reach the Government Commission's task force, that they won't be lost, that they'll be taken into account when decisions are formulated and made?

Rassokhin: Yes. Every letter, article, and comment on the draft law is recorded and put into the daily mail packet which comes to us from the USSR Council of Ministers' expedition.

NTR: PROBLEMY I RESHENIYA: Then what happens?

Rassokhin: One after another, all these materials are read by task force experts. Each one works with those which pertain to his specialty, for example "authorship and priority," "maintaining a patent," "introduction," "remuneration," etc.

In a condensed form reflecting the author's thinking, each opinion is entered into the third column of this table—"Suggestions on the Draft Law on Inventive Activity in the USSR."

The document contains the number of the section, article, paragraph, and subparagraph of the draft law about which the writer expressed an opinion, his profession and job title, and place of residence. The number of similar, matching suggestions is recorded.

The expert enters his opinion on the feasibility of adopting the author's suggestion or the new version of the corresponding statute of the draft which emerges from his opinions.

In the evening, all these completed tables are duplicated and sent to the State Commission task force head, GKNT [State Committee on Science and Technology] chairman B. L. Tolstoy, and its remaining members. The last column of the document, the "Task Force Conclusion" on each of the suggestions received is filled in on this level.

The draft law is thus undergoing a three-step examination at this stage. First, the entire group of participants in the discussion; then experts in innovation processes and lawyers working on our commission; and finally members of the State Commission.

NTR: PROBLEMY I RESHENIYA: The fifth column of the document records the number of similar suggestions. Can this be considered a nationwide vote "yes" or "no" on a particular statute in the draft law?

Rassokhin: An arithmetic approach isn't always suitable; it may result in rash decisions.

Consider this situation. A multitude of inventors and the majority of their letters demand, for example, that experts who make unsound decisions on applications be held liable. The motive is easy to understand: The administrative command system of branch management puts the inventor in the position of a supplicant, and the invention is rendered ownerless. In an inventive environment, this understandably causes exasperation.

But remember, even in ancient times the Romans said quite justly, "Jupiter, you're angry, which means that you're wrong." And in our case, no matter how many of them there are, the authors of "angry suggestions" are wrong. Here's why.

The basic point of the draft law is to move the inventor from a state of oppression to one of partnership with all participants in the innovation process, and the invention from an ownerless to a "commodity" status. Most of all this law will impede the administrative pressure system. But they suggest that we use the strongest tool in this destructive system, punishment, in the new environment. So we're ultimately left in the very position from which we wanted to escape.

In general few people take into account the fact that the law whose draft is now being discussed is one, I'd say, "to grow into." The interpretation of a law as only a

regulation institutionalizing society's current situation has eaten too far into our consciousness. The law's role must be more active. And it must be used to pull us out of stagnation, elevating the level of requirements for legal relations, and it must draw us toward an increasingly refined legal order.

Of course, this means that key norms like the new law on inventive activity in the USSR will not have full effect today or even tomorrow. We need a socialist market, socialist competition so that the consumer's changing demands will have maximum effect on the producer. It is this that can make the modernization of equipment, technology, output, and services a necessity in the literal sense of this word; make an invention a commodity, and an inventor a full-fledged partner of producers of any rank.

Adherents of "punitive regulation" take none of this into account.

NTR: PROBLEMY I RESHENIYA: And deep distortions, it would seem, are the result of the inertia in the thinking particularly of someone who is exasperated...

Rassokhin: Widespread discussion is supposed to uncover them, and the process of preparation is supposed to straighten them out.

However, we must struggle not only with one-sided delusions, but with the mutual misunderstanding of the parties to the debate.

One "hot spot" of this type is on-the-job invention. This concept alone provokes a protest in many inventors. They are convinced that an invention is the property of the inventor, that only he has unrestricted use of it. The strictest administrators, on the contrary, see an invention as merely the result of doing one's job. They consider the inventor a worker, the fruits of whose labor can be only at their—the administrators'—disposal.

Their discussions follow an extremely simple pattern: "I, the director, give him wages, work space, equipment, and information, and he, the inventor, wants to freely drag his invention off 'by the collar.'"

Indeed, that's not quite the point. Because one cannot always say what brought about an invention—the presence or absence of information. I think that sometimes it is precisely because of its absence! Because the inventor fills in a particular blank spot in our technical knowledge with his inventions.

Of course there is a great deal that an enterprises actually gives the inventor that benefits invention and that has its price. But, really, can we scrupulously calculate scientific, inventive, and engineering creativity? It never occurred to anyone to give Newton a bill for the apple that fell on his head and was wasted.

For a reason which has escaped the disputants, we cannot permit an "on-the-job" invention to be arbitrarily and suddenly excluded from the production of new equipment. It is the connecting link between one stage in the equipment's development and the next. Excluding it means disrupting the entire productive chain.

So, by purely technological logic an inventor must transfer the patent for an invention to the enterprise where he created it while doing his job.

NTR: PROBLEMY I RESHENIYA: But then he'll cease to be its owner, and one of the goals of the new legal order for invention is unattainable.

Rassokhin: That's not true. Under these conditions it's possible not to deprive an inventor of the opportunity to remain the master of the situation. Transfer of the exclusive right to an invention created on the job should be considered mandatory, but the conditions for this transfer are the subject of negotiation—mandatory for principles of parity—between him and the enterprise manager.

But then an inventor must be considered not as he has been so far—as primarily a worker doing his job, during which he created an invention—but as a major actor in modernizing technology and equipment.

NTR: PROBLEMY I RESHENIYA: It seems that you, Vitaliy Petrovich, and, one must think, each member of your commission has his own view of the issue being discussed. Can't this distort individuals' opinions expressed by the participants in the nationwide discussion and distort the entire pattern of public opinion?

Rassokhin: I think that everything has been done to prevent this interference. The suggestions we are receiving are presented objectively, on the basis of mutual checking. The document we are to submit to the Government Commission clearly shows where the authors of the suggestions it contains agree and disagree and which of them are exclusive. The experts' opinions are presented there also, but separately. Objective conclusions are simple after comparison.

NTR: PROBLEMY I RESHENIYA: From those "hot spots" in the discussion of the draft law which you touched on, you feel how many complicated and acute problems are arising during the discussion. What do you think? Are the 10 weeks which the Presidium of the USSR Supreme Soviet set aside for discussion enough to consider all the opinions and to permit sufficiently sound work on the draft law? Many people ask this question.

Rassokhin: Those who ask it don't take into account that this draft law will most probably be the first to undergo all parliamentary procedures.

This means that after the text has been worked out at this stage the Commission will present the draft to the USSR Council of Ministers, which will discuss and adopt it. The government will then submit it to the USSR Supreme Soviet. First there will be hearings in at least four committees—legislative proposals and science and technology of both houses—and then discussed in session.

So all interested individuals and organizations can make their suggestions to the committees of the houses of the USSR Supreme Soviet later and, finally, influence the formulation of the new law directly through their deputies. There's more than enough time.

NTR: PROBLEMY I RESHENIYA: What do you think? Will the text of the law which the USSR Supreme Soviet will pass differ greatly from the promulgated draft?

Rassokhin: We'll all have to wait for the answer to that question until the vote in the new session of the USSR Supreme Soviet.

Leading Inventor on Shortcomings of Draft Patent Law

18410172a Moscow SOVETSKAYA ROSSIYA in Russian 22 Feb 89 p 2

[Interview with L. I. Danilov by G. Podlesskikh, date and place not given: "Patent Barrier: Honored Inventor of the USSR L. I. Danilov: 'The Draft Law on Invention Needs To Be Fundamentally Reworked'"; first paragraph is SOVETSKAYA ROSSIYA introduction]

[Text] Leonid Ivanovich Danilov, winner of the Lenin and State Prizes and the USSR Council of Ministers Prize, head of the self-accounting administration for new technology development at the Cherepovets Metallurgical Works, was nominated a candidate for people's deputy at a recent VOIR [All-Union Society of Inventors and Innovators] plenum. This man's name is to a great extent connected to the acceleration of scientific-technical progress in ferrous metallurgy. L. I. Danilov was one of the first to be granted the title "Honored Inventor of the USSR" for his innovative developments, which are of great importance to the national economy. Leonid Ivanovich has devoted his life to invention and active introduction of technical innovations in production. Naturally, our talk with candidate L. I. Danilov was about the draft law on inventive activity. To a large extent it reflects the candidate's election platform.

SOVETSKAYA ROSSIYA: To be honest, Leonid Ivanovich, your speech at the plenum of the VOIR Central Committee was a surprise. You said that if this law goes into effect, it will be a mortal blow against invention. Isn't that too categorical? The draft seems to adhere to all the democratic principles of jurisprudence.

L. I. Danilov: At first glance the draft law on inventive activity in the USSR proposed for nationwide discussion solves many long unsolved problems in the relations among the inventor, the enterprise, and the government. The law is supposed to define the economic, organizational, and legal conditions for invention and ensure that its goal is to create fundamentally new equipment and technology that is competitive on the world market. The objective is to increase the economic interest of enterprises and their workers in creating and using inventions. It calls for broader intangible and tangible incentives. However, it essentially represents almost no progress.

If this law goes into effect, inventive activity will in many cases simply go unpaid. Don't be surprised. That's what will happen if interim patents, which correspond to today's priority certificates, go into effect. The long time it takes to review an application (the four-year validity of the interim patent plus a year for examination) don't promote the circulation of technical approaches. Payment of the fee is put off for five or more years. As a result, the older generation—talented scientists, engineers, and workers—are deprived of the hope of ever receiving compensation. This is why the term of the interim patent should be substantially shortened and payment for an invention in the form of an advance should be stipulated. Until the examining committee recognizes that a technical approach is an invention, an author's fee at least equal to the fee for an innovator's suggestion should be paid if it is used in production. When permanent protection (the patent) is granted, the total fee should be recalculated for the entire period of use.

There is no clarity in the way an author's fee is determined today. It depends on the economic effect of using the invention in the national economy. But the draft retains this indeterminacy. The fee is to be paid from the profit the enterprise realizes from the use of the invention. But what happens if an enterprise earns no profit or return if it uses even the most economically advantageous invention? Don't forget that in most cases profit from use can't be isolated from the total result of economic activity. This statute will therefore result in the preferential use of innovations at highly profitable enterprises, or to a situation in which an author tries to rid himself of a patent by selling it to the most advantageous buyer.

SOVETSKAYA ROSSIYA: Judging in general, a mercantile approach predominates in your evaluation of the draft.

L. I. Danilov: "You can't sell the inspiration, but you can sell the manuscript." Money isn't the point. But we're now talking not about the goal of technical creativity, but about what stimulates it, and it would be foolish to ignore this. A law-maker, like society as a whole, must try to interest the largest number of gifted people in taking an active interest in inventive activity. I believe that to do this both a patent and an author's certificate should

be issued for an invention. Upon submission of the application, the rights to the invention could be transferred to the state, the author receiving only an author's certificate and monetary compensation. The patent for the invention could be issued to the USSR State Patent Fund. But in any case the author must retain the right to the author's certificate, for which no fee is received without a patent.

SOVETSKAYA ROSSIYA: What is your opinion of the role the draft law gives to the USSR State Patent Fund which is to be created?

L. I. Danilov: It's in the very best position: It isn't responsible for anything, but it gets the dividends from inventive activity. I think that payments to the fund equalling one percent of the annual profit from the use of inventions estrange inventors from innovators.

It's strange that the draft doesn't reflect the growing importance of public organizations. For example, VOIR today is directly involved in one of the most important and painful problems of the economy—introducing promising technical novelties into production. The intensification of economic activity is based on the use of economic methods and cost accounting. In less than a year VOIR organizations put more than a thousand inventions to practical use. At the beginning of this year the VTSSPS [All-Union Central Council of Trade Unions] presidium supported a proposal to create a new public organization under VOIR—a Fund for the Coordination of Inventive and Innovative Activity. This is why a special article which would describe the work of this organizations under the terms stipulated for regional invention funds should be added to the draft.

SOVETSKAYA ROSSIYA: As you know, most inventions are job-related. What do you think can be done to stimulate their development?

L. I. Danilov: I think that the matter would benefit if this statute were provided in the law: Legal relations between a worker and an enterprises should be established so that the worker's responsibility is to create new technical approaches and transfer them to the enterprise; the enterprise's responsibility is to prepare applications for these approaches, allocate the funds to keep the patents in force, and introduce the innovative developments in good time. The labor collective's council for active inventive activity establishes a personal bonus in addition to the innovator's wages. Depending, of course, on the worker's contribution to the acceleration of technical progress. And it would be proper to give a grace period for payments to the state budget not until the day the invention is entered into the State Register, but until the day it is first used.

There are more than enough discrepancies, inaccuracies, and blatant misstatements in the document published for discussion. Here's an example to start with. The draft

law on inventive activity doesn't say a word...about what inventive activity is. The question is hardly an idle one when it comes to rewarding collaborating on the introduction of an invention.

To be brief, the draft needs to be fundamentally reworked in view of the socioeconomic conditions in the country, the law on socialist enterprise, and the USSR Constitution.

SOVETSKAYA ROSSIYA: Leonid Ivanovich, you are a candidate for people's deputy from the All-Union Society of Inventors and Innovators. What program are you taking to the voters?

L. I. Danilov: First, I will defend and protect the interests of VOIR, in whose activity I have been involved for 30 years. I believe that today this huge public organization doesn't have the requisite power. Two years ago there was a whole controversy, and proposals were made to merge VOIR with the Scientific Technical Society, to break up our organization. If I am elected, I will defend the integrity of VOIR and try to raise its prestige.

I personally, with great energy and responsibility, will continue the work to which I've devoted my life. I participated in meetings of the USSR Council of Ministers where the draft law on invention was discussed. I defended the interests of innovators as best I could. I'm convinced that they must be provided with all the conditions for creativity. The country's economy and society as a whole will benefit from this.

Inventor Attacks Critics of Draft Patent Law
18410172b Moscow SOTSIALISTICHESKAYA
INDUSTRIYA in Russian 14 Feb 89 p 2

[Article by A. Kozlov, assistant chief engineer, "Schet-mash" Production Association, candidate in technical sciences, datelined Kursk: "Haven't They Grown Up?"]

[Text] In his life everyone seems to have an activity to which he devotes his best years and in which he finds happiness. For me it's invention. Some people are extremely lucky. I submitted my first application in 1970. Now I have 35 inventions and a good backlog. So the reader will understand the impatience with which I awaited the draft of the new law on invention. The draft has been promulgated. I haven't enjoyed reading anything published recently as much as I have this document (although the press provides an abundance of food for thought). But information from the TsS VOIR [Central Committee of the All-Union Society of Inventors and Innovators] made me pick up my pen.

The narrow thinking of certain VOIR leaders is astounding. They cry about the difficulties of the poor inventors and believe that "we have to think up a law" that would put them in the bright future.

Our practice convinces us that "thinking up" laws is not justified. Laws must be based on objective economic and political grounds. Only then will they be effective. As a result of perestroika we must reorganize our society on the basis of the socialist market. Hence the main goal of the new law is to answer the question, Is an invention a commodity, is it included in the socialist market market? If it is, then the draft, with all its other specific faults, serves its purpose. If it isn't, then it doesn't achieve its goal.

For some reason the Central Committee plenum ignored this fundamental question. And the fact that VOIR isn't even mentioned in the draft was noted and taken as a mortal offense. The people at VOIR took a stand: The draft is bad through and through.

Fine—that's the apparatus. But I can't understand the inventors on the VOIR Central Committee who spoke at the plenum. Here's what L. Danilov, a widely known inventor in our group, had to say.

"If the draft goes into effect, it will be a mortal blow against invention."

How can one strike a blow against invention, which was knocked out many years ago? If we don't introduce inventions, we will be disastrously behind in the technical level of products and rapidly drop to the level of the developing countries. I'm not questioning the competence of Danilov and those like him when it comes to invention. But I submit that having won state prizes and the title "honored," they are quite satisfied with the situation and they unwillingly closed ranks on the fundamental problems with the bureaucracy of the VOIR Central Committee.

And what's the value of the opinion of "science," on whose behalf Professor V. Dozortsev, doctor of legal sciences, probably spoke: The draft in its present form is questionable from the political, socioeconomic, and legal standpoints. And it sometimes even contradicts recent revisions in the USSR Constitution. Hence an invention cannot be made into a commodity, the socialist market is best forgotten, the best thing would be to dust off and pretty up the good old existing statute.

After such authoritative discussions, it was proposed that the discussion be prolonged until July 1 of this year. I. Bortnik, deputy chairman of GTNK [State Committee for Science and Technology], believes that we are not ready for the law. If we would issue an interim statute which we would revise annually.

Here is an example of how the mechanism for slowing perestroika is triggered. It's proposed that the law be stuffed into the proper box. It doesn't tie anyone's hands and feet, and GKNT can cope with the interim statutes. The series of instructions, directions, letters, and explanations simply emasculates it. On this account we have lots of experience.

One must hope that there are healthy forces in our society and that they will not allow the law to be tossed into a corner. Let me express a few thoughts about the law.

The criterion of "non-patentability" (art. 6) is difficult to comprehend. There is no doubt about its necessity: It is used in international practice. But there must be a clearer interpretation which would eliminate arbitrariness on the part of the examining committee.

Article 12 permits six forms of patent ownership, including joint between an author and an enterprise. Different interpretations are inevitable. I proposed that this form of patent ownership be excluded from the law, but that an economic mechanism be provided to transfer the rights of the patent owner (from author to enterprise) at any stage of patent application.

Objections to payment of a fee for reviewing an application, performing and examination, issuing a patent, and maintaining its validity are groundless. If an invention is a commodity, all services should be remunerated. The author himself should decide if he will pay out of his own pocket or cede the rights of patent ownership to the enterprise, which would assume all expenses. This would diminish useless work by the examination committee.

This is fine for empty applications, but what about schoolchildren, students, and retirees? They are simply unable to pay a fee. That's right. Isn't that what VOIR is for? A union of inventors, young people's technical centers? Finally, intermediary cooperatives, etc. A good idea, being an intellectual commodity, will be supported on the socialist market.

VOIR Given Voting Rights in Patent Disputes
18140175b Moscow IZOBRETATEL I
RATSIONALIZATOR in Russian No 1, Jan 89 p 20

[Article by V. Smirnov, member of the Control Council of the State Committee for Inventions and Discoveries and head of the Department of the Protection of the Rights of Authors of the Central Council of the All-Union Society of Inventors and Efficiency Experts, under the rubric "At the New Stage. The Protection of the Rights of Authors": "Your Public Defender. Notes of a Member of the Control Council"; first paragraph is IZOBRETATEL I RATSIONALIZATOR introduction]

[Text] The protection of the rights of authors in the Control Council is a new matter for the Central Council of the All-Union Society of Inventors and Efficiency Experts. For the first time the representative of the All-Union Society of Inventors and Efficiency Experts has equal rights with the representatives of the State Committee for Inventions and Discoveries to decide the fate of an invention.

First a few figures: annually the Control Council of the State Committee for Inventions and Discoveries considers about 10,000 different complaints of declarants, of which approximately 3,000 are from what are called "self-employed" authors. Whereas the authors of "job-related" inventions have the right to count on the skilled assistance of patent experts, can obtain material support in the form of the payment of travel expenses for a trip to Moscow, and, finally, have greater chances of finding a room in a hotel, the self-employed person is left to his own devices. He travels on his own hard-earned money, roughs it at night in railroad stations, and fights single-handed for his creation. In the Control Council and at the expert conference he has occasion to clash with the concerted, united will of experts of a different level.

Comparatively recently the Central Council of the All-Union Society of Inventors and Efficiency Experts and the State Committee for Inventions and Discoveries, which was forced to agree to such an arrangement under the pressure of the public, decided to organize a council of nonstaff experts of the Central Council of the All-Union Society of Inventors and Efficiency Experts, who have the right to represent the interests of the authors of applications in the Control Council with the right to vote. Ministries, which recommended the most experienced, competent patent experts, participated in the selection of the experts. In all 65 of them—doctors and candidates of sciences—were picked. By order of the chairman of the State Committee for Inventions and Discoveries they were made members of the Control Council of Scientific and Technical Evaluation.

Although the experts of the All-Union Society of Inventors and Efficiency Experts began to work recently, there is something to tell the readers of the journal about.

The correspondence of I. Rakhlevskiy on an application for an automatic machine for the inspection of bottles with a transparent liquid for the purpose of detecting foreign inclusions in it was carried on for 16 years. During this time the author sent 77 letters to the State Committee for Inventions and Discoveries and the Control Council, while the total correspondence comes to more than 500 pages. The Crown Cork firm (the United States) had worked on an analogous problem since 1973, the Strunk firm (the FRG) and Soviet authors has worked on it since 1955. I. Rakhlevskiy received a priority certificate from the All-Union Scientific Research Institute of State Patent Examination in 1972. Two nonstaff experts defended the interests of the author in the Control Council (one of them is the author of these lines). After 16 years the decision was made to issue an author's certificate.

At times a problem is also solved without an appearance in the Control Council. For example, A. Kostin, an inventor from Vologda, called at the Central Council of the All-Union Society of Inventors and Efficiency Experts. He did not agree with the rejection of the All-Union Scientific Research Institute of State Patent

Examination and believed that the evaluation was mistaken. Having been convinced that the author is most likely correct, I called V. Blinnikov, director of the All-Union Scientific Research Institute of State Patent Examination, and asked that the experts be commissioned to make once again a careful comparative analysis. Though not immediately, the old decision was repealed, and they issued the author a positive decision.

There is a more complicated case. Yu. Yemelyanov and M. Yemelyanov proposed a high-frequency industrial tube ozonizer with the direct-flow cooling of the electrodes and received a priority certificate in 1963. After numerous rejections of the Expert Council and the Control Council the latter in 1980 made a final decision—to reject.

The Central Council of the All-Union Society of Inventors and Efficiency Experts 7 years later addressed to the State Committee for Inventions and Discoveries the request to make a control evaluation. Again a rejection. At that time the Central Council of the All-Union Society of Inventors and Efficiency Experts enlisted E. Skorniyakov, chief of the Patent Department of VNI-*IKhrom* and a former expert of the All-Union Scientific Research Institute of State Patent Examination. (He for sure knows how to defend the interests of an applicant!) And, indeed, Skorniyakov found new evidence which the Control Council recognized as deserving attention. After 25 years a positive decision was issued to the author.

Unfortunately, the authors of "job-related" inventions cannot always count on the assistance of their patent departments. Why? The reasons are varied, but most often it is official negligence. Here is an example.

Doctor of Medical Sciences V. Kozyrev, a professor and neurosurgeon, turned to the Central Council of the All-Union Society of Inventors and Efficiency Experts for help: the repeated requests of the author to the experts of the All-Union Scientific Research Institute of State Patent Examination to receive him and to hear his explanations met the obstinacy of the latter—there is nothing to talk about, everything will be written in the decision!

Only after the intervention of the Central Council of the All-Union Society of Inventors and Efficiency Experts and an appeal to the management of the All-Union Scientific Research Institute of State Patent Examination did they decide to receive and hear Kozyrev. However, the matter made no progress. It turns out that a nonstaff worker conducted the examination, he could not understand the essence, and asked the Clinic imeni Burdenko to give a conclusion. The management of the clinic replied: we cannot, the specialist is on leave. Where is one to turn? By order of the USSR Ministry of Health the group of medical institutions, which are permitted to give conclusions on applications, is clearly limited. If you wait, it is possible to lose the priority of the state, but the problem is extremely important. By

joint efforts they obtained a conclusion from the First Moscow Medical Institute, which was signed by Professor V. Zilov. The conclusion is positive! But the evaluation is again the same—"the essence of the invention is not comprehensible."

The question had to be submitted to the Control Council. During the analysis of the application it was found that the Patent Department of the First Medical Institute of the capital had drawn it up carelessly, due to which it was difficult for the expert commission to establish the basic claims of the author.

So that the reader would not form the opinion that the expert of the All-Union Society of Inventors and Efficiency Experts always win the case and is always correct, I will note: we have also had failures, for example, with the well-known inventor D. Raksin, whose epic *LITERATURNAYA GAZETA*, *SOTSIALISTICHESKAYA INDUSTRIYA*, *IZOBRETATEL I RATSIONALIZATOR*, and many other press organs described. They never restored by joint efforts in the Control Council the inventor's certificate for a method of cutting collars from a pelt, which had been issued to D. Raksin and was revoked in 1976—the arguments of the experts proved to be stronger.

Today the council of experts attached to the Central Council of the All-Union Society of Inventors and Efficiency Experts is for the present performing the functions of a nonstaff expert commission. Muscovites and residents of Moscow Oblast were lucky: 16,000 rubles were allocated to the Moscow City Soviet for the organization of an expert commission, the residents of the oblast can also appeal to their council of the All-Union Society of Inventors and Efficiency Experts. Other oblast and republic councils of the society for the present are just developing and are trying to find staffs of experts. Therefore, the Central Council of the All-Union Society of Inventors and Efficiency Experts is accepting written applications for skilled assistance from residents of various cities of the country. However, today it is already clear that it is not that easy to find trained specialists—they must be trained. Today the main task of the oblast, kray, and republic councils of the All-Union Society of Inventors and Efficiency Experts lies in this. If a system of defense councils is not developed throughout the country, the efforts of the Central Council of the All-Union Society of Inventors and Efficiency Experts will be too limited. Is it really possible to accept everyone who wants to receive help!

But not only the nonstaff experts must correct the situation with patent examination. Its quality thus far has evoked great reproaches on the part of applicants. Why not organize the extradepartmental monitoring of the examination? Something like the Higher Appellate Council attached to the State Committee for Science and Technology. Establish an All-Union Agency for the Protection of the Rights of Inventors. Organize under the

Central Council of the All-Union Society of Inventors and Efficiency Experts and local councils something like the legal inspectorate of trade unions.

Many proposals on this account are being received, the Central Council of the All-Union Society of Inventors and Efficiency Experts and the Department of the Protection of the Rights of Inventors are analyzing and generalizing them, in order to go with proposals to the USSR Council of Ministers and the All-Union Central Council of Trade Unions.

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Inventors' Fund To Facilitate Introduction of New Technology

*18140175a Moscow IZOBRETATEL I
RATSIONALIZATOR in Russian No 1, Jan 89 p 9*

[Article under the rubric "Problems. The All-Union Society of Inventors and Efficiency Experts at the New Stage": "The Updating of the Functions, Goals, and Means in the Organization of Creative Technical Work Has Been Undertaken by the Central Council of the All-Union Society of Inventors and Efficiency Experts Jointly With the All-Union Central Council of Trade Unions"]

[Text] The establishment of the Fund of Inventive and Efficiency Promotion Activity (FID) will serve the strengthening of the economic and cost accounting principles in the work of the most massive organization of innovators—the All-Union Society of Inventors and Efficiency Experts. The initiative in this matter comes from the Central Council of the All-Union Society of Inventors and Efficiency Experts and the Department of Mass Production Work and Wages of the All-Union Central Council of Trade Unions. The necessary documents have been prepared; they will be examined, apparently, at the next meeting of the secretariat of the All-Union Central Council of Trade Unions.

In conformity with these preliminary documents the Fund will open its own shops, workshops, and laboratories, will lease production capacities for the making of models of new equipment and technology and the duplication of promising innovations, will finance the proposals of innovators, enterprises, cooperatives, and temporary creative collectives, and will establish joint stock companies, introducing and intermediary organizations, and temporary associations for the implementation of major developments, including intersectorial developments, by the attraction of assets, material and technical resources, and personnel on the side—from interested state, cooperative, and public enterprises and organizations.

The Fund in its economic activity will cooperate with foreign partners by the establishment of joint ventures for the output of products, which are based on inventions, and the rendering of services, which belong to the sphere of activity of the Fund of Inventive and Efficiency Promotion Activity.

The Fund will launch publishing and advertising activity and will give assistance to the conclusion of commercial agreements and deals on the use of inventions and efficiency proposals, including with foreign organizations and firms.

The starting capital of the Fund is being formed from the money, which was placed at the disposal of the Central Council of the All-Union Society of Inventors and Efficiency Experts by the Presidium of the All-Union Central Council of Trade Unions (an interest-free loan of 10 million rubles—see IZOBRETATEL I RATSIONALIZATOR, No 8, 1988, p 2; No 9, 1988, 2d page of the cover), as well as the assets, which are envisaged in the budgets of the councils and sectorial commissions of the All-Union Society of Inventors and Efficiency Experts, from the trade union budget, which are allocated by the central committees and republic, kray, and oblast councils of trade unions in the form of interest-free returnable loans, as well as voluntary payments of members of the Fund of Inventive and Efficiency Promotion Activity—individuals and state, cooperative, and public organizations. The Statute on the formation and spending of funds—the authorized, reserve, and insurance funds, as well as the fund of social development and the remuneration of the labor of the staff personnel of the board is being prepared. They will be paid by means of the revenues that are derived by the Fund as a result of its economic activity. The wage rates of staff members are being put on the same level as the salaries at scientific research organizations that have been converted to full cost accounting and self-financing. The first secretary of the board of the Fund will receive the salary of a director of an institute. Bonuses for the personnel of the Fund are envisaged—up to 50 percent of the salary. The assignment of the management personnel of the Fund to one group or another in the remuneration of labor is being made dependent on the annual amount of work that is performed by the Fund. Subsequently it is proposed, on the basis of the financial status of the Fund, to make changes in these indicators, in order to stimulate the interest of the staff personnel of the Fund in increasing its assets.

As the founder of the Fund the All-Union Society of Inventors and Efficiency Experts is assuming the functions of the guiding instance—it approves the structure of the board of the Fund and selects and appoints staff personnel on the representation of the board of the Fund of Inventive and Efficiency Promotion Activity and its departments.

In the preliminary document, which was made available to the editorial board, the economic aspect of the interrelations between the All-Union Society of Inventors and

Efficiency Experts and the Fund is not examined. It is proposed just for the period of the organizational and economic formation of the Fund to allocate to its board in Moscow 250,000 rubles for the remuneration of labor and the payment of bonuses to the staff personnel. Of this sum the Central Council of the All-Union Society of Inventors and Efficiency Experts is providing 100,000 rubles from its own assets and the All-Union Central Council of Trade Unions is providing 150,000 rubles through the trade union budget as an interest-free loan with repayment during the 13th Five-Year Plan. It is proposed to transfer to the balance sheet of the Fund the Palace of Culture imeni Astakhov, a monumental building, which, however, needs serious repair and is located very far from the center of the city (about 10 minutes by bus from the Tekstilshchiki metro station), which for institutions of this sort, of course, is bad.

The founding of the Fund of Inventive and Efficiency Promotion Activity may become an important milestone in the history of technology of our country. Personnel of

the Central Council of the All-Union Society of Inventors and Efficiency Experts and the All-Union Central Council of Trade Unions are preparing the Charter of the new organization, which later will be discussed, examined in the instances, and approved. One must, however, take into consideration the fact that this sort of initiative is not the only one and not the first one in our times. The delay with the drafting and adoption of documents and with the start of the practical activity of the Fund and its departments is giving odds to competitors—the Union of Scientific and Engineering Societies, the creative scientific and technical work of youth, and others—in the attraction of the best organizers and specialists, the engagement of inventors and scientists, the obtaining of profitable orders, the development of publishing and advertising activity, and so forth. In this situation, perhaps, one should prefer a decision, which is not ideal, but is quick and makes it possible any day now to get down to concrete business.

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Bureaucratic Obstacles to Introduction of Composite Materials

18140176 Moscow IZVESTIYA in Russian
22 Feb 89 p 2

[Article by Academician I. Fridlyander: "Stainless Stereotypes Are Hindering the Introduction of Advanced Materials"]

[Text] Last year an article by Deputy Minister of the Aviation Industry A. Bratukhin and R. Shalin, director of the All-Union Institute of Aviation Materials, and the author of these lines "Composites Are Knocking at the Door" was published in IZVESTIYA (No 33). After the appearance of the article the question of new materials, including composites, was considered in the Presidium of the USSR Council of Ministers. The decision was made to formulate the corresponding statewide scientific program. At present the State Committee for Science and Technology jointly with the USSR Academy of Sciences and the USSR State Planning Committee are working on its establishment. Groups of scientists and specialists, who under the scientific supervision of Academician B. Ye. Paton are preparing the corresponding expert evaluations and proposals, have been organized.

It would seem, the door has been opened wide to composites, and now it remains merely to approach quickly the world level. However, the paths of even the best scientific programs to practice are incomprehensible. Although in a number of sectors, for example, in the aviation industry, composite materials are already being used successfully, as a whole in the national economy there is a calm. The old mechanism of thinking, or rather of hindering thought, remains a strong obstacle in the way of everything new.

The former stereotypes remain in the policy of investments, in which there is not only no resolute turn, but also no half turn in the direction of new materials. High prices have been established for composites, while low prices have been established for metals. This, of course, is stimulating the use of only traditional metals. Throughout the rest of the world, especially in the highly developed countries, such a ratio of prices is the "inverse" of ours.

In general we know very little about what is being done in the world in this area of science and technology. Our designers and process engineers, as before, prefer to use traditional, though technical backward, yet customary materials, which do not require any particular efforts, retraining, and new decisions. Moreover, the development and assimilation of new materials are being carried out in our country at gigantic scientific and scientific production associations, which owing to their scale are disposed to inertia and bureaucracy.

For all these reasons it is extremely important for us to check the trends, structural changes, and methods of the organization of work in the area of composite materials in

the leading industrial countries. From this point of view the Techmat-88 conference and exhibition, which were held last year in Paris, were of great interest. Very much attention was devoted there to composite materials.

I will recall that composites are a combination of high-strength, heat-resistant, or especially rigid (high-modulus) thin fibers and a polymer, metallic, or ceramic matrix, into which these fibers have been immersed and which bonds them into a monolithic body. Precisely such fibers owing to a number of peculiarities enable the material to acquire record characteristics that are unachievable in massive sections.

The most popular and comparatively inexpensive composite is glass-reinforced plastic, in which the reinforcer is glass fibers, while the binder is resin. What they are not making in the world out of glass-reinforced plastics! At the Paris exhibition it was possible to see the airframes of light airplanes and electrical engineering items, prefabricated construction structures, tanks and pipes, especially for chemically active products, parts of motor vehicles, sporting and household goods, and items of medicine.

The latest composites, in which carbon fibers and organic fibers (organic plastics) are used as the reinforcers, appeared after glass-reinforced plastic. The former are one-ninth as heavy, while the latter are one-eleventh as heavy as steel and are substantially stronger. In specific strength they surpass steel by approximately fifteenfold. In a discussion with the participation of leading foreign designers it was indicated that in motor vehicles of the 1990's composites not only will begin to be used extensively, but will also dominate in the most advanced makes.

These and other fibers for composite materials and composite materials themselves have turned into an important item of the high technology exports of the United States and especially Japan. Here we have something to study in order to export not petroleum, gas, and timber, which are losing value, but fibers and composites, which have been obtained from them.

The production of composites abroad is increasing rapidly. Whereas in 1977 in Western Europe and the United States respectively 350,000 tons of composites each were sold, in 1986, 1 million tons each were sold. In 10 years there has been a trebling of output! By 2000-2005 both for the United States and for Western Europe the attainment of a level of the annual consumption of composites of 2.5-3 million tons is expected. It is interesting to compare these figures with the level of consumption of steel in the same countries: in 1977 in the United States it was 134 million tons, in the Common Market countries of the European Economic Community it was 117 million tons; in 1986 it was respectively 99 million and 103 million tons.

The world trend is quite definite. We also need to draw the corresponding conclusions. How many tons of raw steel can a ton of composites replace? With allowance made for the

lower (one-fourth as great) density, the higher (two- to threefold) yield in case of the production of finished parts, and the longer life span (two- to threefold) theoretically it is 15-25 tons, in practice it is 4-5 tons.

The solution of the permanent crisis since the 1970's of western ferrous metallurgy, the closing of metallurgical plants, and even the payment of bonuses to the member countries of the European Economic Community for cutting back metallurgical capacities lies in the rapid increase of the consumption of composites and other new materials.

In this connection the increase of steel production in the USSR and the trend toward the continuation of this increase or at least toward the stabilization of the achieved level up to 2000-2005 is incomprehensible. Thus, during the same period of 1977-1986 steel consumption in our country increased from 145 million tons to 161 million tons. A characteristic redistribution of the share of different countries is occurring in world steel consumption. The share of Western Europe decreased from 19.2 percent in 1979 to 17.2 percent in 1987, that of North America (the United States and Canada) decreased from 20.9 percent to 15.5 percent. The share of the Soviet Union and the CEMA countries increased from 28.1 percent to 29.2 percent, that of the developing countries increased from 12.9 percent to 15.5 percent. Comments are unnecessary. It is high time for us to ponder what stereotype we are following to this day.

For the sake of fairness it must be said that starting in 1989 the first changes in the attitude toward composites appeared in our country. Recently IZVESTIYA (No 32) in the article "The Space Launch of the Executive Committee" told about the introducing experience of the Kompozit Scientific Production Association. But does this mean much on the scale of the country?

Why is such rapid progress being achieved in the West in the area of composites, while as before we are lagging here? Let us look closely in this connection at foreign experience. Here, for example, is how the work on composites has been organized in France. There hundreds of large and small firms and enterprises are engaged first of all in research, technological development, and industrial production in this area. Some of them are general, others are narrowly specialized. A significant number of the firms, mainly ones that are small in size and compete with each other, are ensuring an overall, unconditional orientation toward the needs of the market, the rapid assimilation of the latest achievements of science and technology, and the rush filling of orders.

The enterprises and firms for composites are united into a general syndicate of reinforced plastics—SCIPA. The syndicate promotes the industrial activity of the member firms and the increase of their competitive ability, particularly in connection with the preparation for the elimination in 1992 of all customs barriers in the countries of Western Europe.

For the settlement of technical and economic questions SCIPA joined the FRANCPLAST Federation, which unites 3,000 firms with 120,000 workers (the mean statistical number of workers per firm is 40).

Both federations and syndicates are formed exclusively on free, voluntary bases. Administration by mere decree and bossing have been eliminated. The firms pay dues and in return receive the support of the federations and syndicates in the form of forecasts of the most promising directions of scientific and technical progress, industrial activity, and market conditions, legal assistance, and assistance in the development of vocational education and in questions of labor safety techniques and environmental protection.

The information Center of the Support of Composites (TsPK), which advises enterprises and firms on all questions of composite, matrix, and auxiliary materials, on the producers of machines and equipment, on forecasts on the French and international markets, and on universities and institutes of the corresponding type and provides information on technical and trade enterprises for composites of the entire world, has been operating since 1986.

It is necessary to note specially the vital importance which is being attached to information. In practically all industrial countries journals are being published and numerous books on composites are appearing. Thus, last year the 1,000-page "Reference Manual for Composite Engineers" was published in the United States. In all 100 authors participated in its preparation.

I am citing all this not for the sake of being surprised once again: "There they know how to do everything properly." No, this is information for reflections, conclusions, and actions. After all, because of our thoughtlessness, because of our lack of understanding we also lack to this day in practice journals, books, manuals, and regular international conferences—both in the country and within CEMA—on composites.

Science cannot develop without the exchange of information.

Returning to composites and to the experience of the West, it is necessary once again to emphasize that the industrially developed countries have adopted a resolute policy of the most intensive development of new advanced materials—composite, polymer, and ceramic materials. Their share in these countries among other materials already now comes to 15-20 percent, the preliminary plans for 2000-2005 are 30-40 percent, while in Japan they are even 50 percent. Inasmuch as the new thinking presumes the unity of word and deed, in the area of composites we should have not only words, but also deeds, which are capable of changing the dynamics of the development of our national economy so that new materials in our country would also hold a place which conforms to the present world standards.

**Consortium Ready To Trade Soviet 'Know How'
For Imported Equipment**

18140163 Moscow SOTSIALISTICHESKAYA
INDUSTRIYA in Russian 11 Feb 89 p 3

[Interview with A. V. Kuzin, president, "Biokor Interneshnl" International Consortium: "If You Have Any Ideas" first three paragraphs are SOTSIALISTICHESKAYA INDUSTRIYA introduction]

[Text] Although less than a year has passed since its creation, the "Biokor Interneshnl" International Consortium has managed to win a strong position on the world market. In this time, branches have started up in different countries and departments have been opened in 82 cities within the Soviet Union. The production of science-intensive, competitive output has been set up. Today, the consortium's turnover consists of millions of dollars and is growing constantly.

Our interlocutor, 32-year-old A.V. Kuzin, heads this international association of companies and cooperatives. Many of his ideas and personal developments formed the basis for the items being produced by the consortium. Some of them, as visitors to the recently held international "Nauka-88" exhibition in Moscow became convinced, have no analogues. A TASS correspondent interviewed the leader of this consortium specially for the SI Business Club.

"We demonstrated a number of interesting novelties on the opening-day for the latest technologies," boasted the "Biokor Interneshnl" president.

TASS correspondent: In what field?

A. V. Kuzin: We are creating and implementing automated complexes for diagnostics, and biological and sociocultural correction of the organism, we supply other medical equipment and computer hardware, and we conduct research in biology and biotechnology. It should be stated that our specialists have gained excellent experience in commercializing scientific knowledge.

TASS correspondent: How successful have you been in applying this in the USSR?

A. V. Kuzin: We are fully utilizing the possibilities offered by restructuring. We are researching innovation directions and studying the potential of the Soviet market. On this basis we have intermediary functions.

TASS correspondent: What about relations with joint enterprises?

A. V. Kuzin: Yes, of course. We help form and set up the successful operation of such production and offer cooperation in manufacturing various kinds of production and in assimilating new services. The Law on Cooperation in the

USSR, which has opened up prospects for initiative-minded, thinking business people, has become the basic document that regulates our business operations.

TASS correspondent: Judging by everything, you actively use Western technologies, but for the most part apply domestic ideas.

A. V. Kuzin: That is correct—an international intellectual exchange is taking place. Let me give an example. Assume that an electrocardiograph costs 600 rubles, while an instrument to automatically analyze cardiograms using microprocessors costs more by a factor of 10. It is profitable to assimilate it together? Of course! Thus, the most valuable thing we have in our country is intellect, and it is possible to successfully join it with Western technology and obtain production competitive on the world market. Today it is the fashion to convert instrument assemblies into complexes, and complexes—into cybernetic systems. Along this path, it is entirely possible for our country to make a weighty contribution to the international division of labor. However, we are far from calling for intellectual "barter"—the mechanical sale of our knowledge abroad.

TASS correspondent: So, it is a question of more intense international cooperation. In what specific spheres?

A. V. Kuzin: A great deal of work is being done by the consortium's enterprises in the "know how" trade. Currently, this is still a little-used concept in our country. Translated, "know how" means "I know how to." However, we do not trade in new ideas and developments, but in their utilization. One receives a sort of "black box," which cannot be looked into. We are not exporting intellect abroad in pure form, but to make up for it, we grant the possibility of using it in joint production with mutual profit. I see a tremendous reserve in this for improving the Soviet economy, a source of hard currency not through investments and credits, but by combining our intellectual product with their technology.

TASS correspondent: What is preventing this?

A. V. Kuzin: Unfortunately, a great deal. The USSR Academy of Sciences, for example, has a department of information science, but it is impossible to patent software. Moreover, even the Law on Inventor's Work currently under discussion does not stipulate this.

TASS correspondent: So, from the very start we have not been guaranteed against leakage of the most valuable information, which should mandatorily be protected by the patent system and can be an initial product for "know how" trade only in this case.

A. V. Kuzin: I will speak of this as well. We see a second type of activity, unrelated to "know how," in the technical retooling of our enterprises. After renting them, forming cooperatives, and assimilating advanced technology, including Western, it is possible, I am sure, to lift

them up to the output of high world-class products. Today, this is hard to achieve. We should extensively use the experience of our partners in the West. Having thoroughly studied the world market, we are in a condition to receive orders (right now, up to 600 of our items could already enjoy success abroad) and distribute them within the USSR. Often, this turns out unsuccessfully, since we have no powerful production base in the Soviet Union, although we unquestionably will in the future. It is very difficult to distribute the orders which are received among existing industries—as a rule, their plans have been rigidly and previously assigned.

TASS correspondent: Enterprises in which sectors would be able to receive such contracts from "Biokor Interneshnl?"

A. V. Kuzin: I invite instrument building, electronics, and food industry workers to accept hard currency orders from our existing package.

TASS correspondent: What do you see as the advantage of your activity for society on the whole?

A. V. Kuzin: First, that of making people healthier by creating a prevention and diagnostics system for many diseases. In particular, we are now designing the country's first innovation state-cooperative medical center, "Biokora," involving foreign companies. It will enable the more effective application of new developments in treatment and in the pharmaceutical industry. The builders, materials, and funds exist. It remains only to legally register the business.

Except for "know how," we are not exporting anything beyond the country, but we import modern equipment acquired with hard currency. This work of ours will become more active starting on 1 April, when all cooperatives will be permitted access to foreign markets. A foreign trade association, "Biokor Impeks," has already been created which will raise our ability to compete on the Western market. For example, the question has already been raised of a merger of "Biokor Interneshnl" with the West German "Glakhe Internatsional KG" from Cologne, which has over 40 years experience in advertising and exhibition work, and has been functioning in the Soviet market for more than 20 years.

TASS correspondent: What still obstructs your enterprising activity?

A. V. Kuzin: The main difficulty is a misunderstanding of the essence of our activity. The development of scientific production cooperatives enables the solution of many problems. After all, what is happening right now? A cooperative association of physicians cannot have an engineer on its staff, and vice versa. Yet, after all, it is hard to find a similar institution, which incorporates everything that cooperatives have at their disposal.

I am not at all giving cooperatives some sort of special status. Indeed, we do have a circle of people who want to become wealthy. However, there is something else. As a charitable deed, "Biokor" has proposed creating a free cafeteria with 5,000 meals per day. It is a shame that we have not received support for our initiatives, although we were prepared to do everything ourselves, with our own resources. I still run into such moments in other charitable works of ours, although there are also many other examples. I rejoiced, for instance, that many of our cooperatives actively helped to eliminate the consequences of the earthquake in Armenia. However, after all, we are able and ready to do more!

TASS correspondent: How do you rate the intellectual potential of our country and society?

A. V. Kuzin: There is nothing similar to it in the world. This is our main point of support. We are holding contests for the best developments in the fields of medical equipment, pharmaceutical production and national medicine. Large awards of 40-50,000 rubles have been set and will serve as an excellent incentive. We have a large bank of data, theories, ideas and concepts. It is a shame that it is still being poorly used or used at a technologically low level. The draft Law on Inventor's Work does not propose the patenting of new instruments. It turns out that ideas are taken from domestic developments, translated into the West's componentry, and the designs are patented there and sold to us. We must fight against this.

I am sure that our intellectual potential will developed and that technology and the technological base will pull itself together. In my opinion, the best way is, within the laws of transfer, to organize the "know how" of our research and our creative thinking with Western technology along cooperative lines.

TASS correspondent: Therefore, it is a question of creating a unique intellectual bank?

A. V. Kuzin: Precisely. "Biokor Interneshnl" participates in the Moscow "Interznaniye" Innovation Commerce Bank, within the rights of a founder. In order for its work to be active, a good reserve of ideas, technologies and patents which, after being financed by the innovation bank, would be rapidly applied in industry and provide a profit, is needed. One such intellectual bank has been created in "Biokor Interneshnl."

TASS correspondent: So, what are its aktiv?

A. V. Kuzin: "Well, that is a commercial secret," A. Kuzin ends the conversation with a smile. "So, forgive me, I cannot answer. I will only say that there are many ideas and enough work to last up until the 21st century."

Joint Venture With Norwegian Firm Supports Soviet PC Industry

18410183b Moscow *ECONOMICHESKAYA GAZETA* in Russian No 48, Nov 88 p 8

[Unattributed article: "West International on the Soviet Market"]

[Text] A plant for producing diskettes for use in instruction computers is now being built in Kazan.

There are now about 15,000 personal computers in Soviet schools, but there will be many more. They need new modern programs. A plant in Kazan with a capacity of 100 million diskettes a year is being built under a turnkey contract by the Norwegian company West International, located in Oslo.

"We are supplying almost everything except the building," says Leif Halvorsen, a director of West International. "The plant will check, determine the production run, stick on the labels, package the diskettes, and produce all written documentation required for the software. The company also supplies systems for data processing and for monitoring management and production."

"This means a plant with 2,500 employees," says Halvorsen. "This order is typical for us. West International's basic philosophy is to take on the major, large-scale projects and supply everything until they are completed, right up to obtaining the final result. About 100 people in the company are working on the 'Kazan Project.' These are people at our headquarters in Oslo, our subsidiary in London, and in our Moscow office."

10 Years of Collaboration

The company has had business contacts with the Soviet Union since 1978. In 1979, an agreement was signed on scientific-technical cooperation with USSR GKNT [USSR State Committee on Science and Technology] and USSR Minpribor [Ministry of Instrument Making, Automation Equipment and Control Systems]. In 1982 a protocol on the development of electronic medical equipment for the Bakulev Institute in Moscow. In 1986 an agreement was signed on scientific-technical cooperation with the USSR Academy of Sciences, and the company opened its own office in Moscow in cooperation with Ineum.

"By the way, the previous agreements were carried out by assignment from my former employer, Mikron Company. Mikron is now one of the many subcontractors on various projects," says Halvorsen. "This division is advantageous: We select goods all over the world and don't have to depend on producers. One of our key goals is to find technically advanced goods at competitive prices, so that we bring them together according to the client's requirements."

In 10 years of cooperation with Soviet partners, West International has supplied equipment to about 60 buyers. Specifically, it has supplied computers for assembly lines as VAZ [Volga Automotive Works] and computers for registering patients and diagnosis at the Bakulev Institute. Control systems have been supplied to various organizations.

"What these systems have in common," says Halvorsen, "is that they are based on integrated computer designs, i.e., automated process monitoring systems, control systems, or applied systems for medical or scientific purposes."

A New Partner

"The State Committee on Computer Science and Computerized Information Processing has become a new partner," Halvorsen continues. "This organization consults with major enterprises and organizations on buying computers and related equipment."

West International is now negotiating with two Soviet organizations on developing joint ventures. It is anticipated that the agreements will be signed in 1989.

West International's participation in the "Nauka-88" trade show will promote the development of collaboration with Soviet partners. This trade show will take place in Moscow from November 22 through December 1. Two booths representing the Norwegian parent company and the English subsidiary are planned. About 20 company representatives from Norway, the USA, Belgium, and the FRG will participate in the trade show.

Stimulus for Export

"Projects like the plant in Kazan make it possible to expand export from the USSR to the West," notes Halvorsen. "After orders from Soviet schools are filled, the plant will have excess capacity. The printing plant can then produce, for example, brochures and other materials for Western companies at quite competitive prices. Printing equipment is being bought in West Germany, and it meets the strictest requirements for product quality. However, it is important that the Soviet enterprise meet delivery dates and ensure high-quality product."

"It's easy to find buyers when prices are competitive. On the other hand, it's easy to lose them if delivery dates are missed," West International director Leif Halvorsen concludes. He speaks Russian, and he very much likes working with Soviet partners.

Soviets, French Sign Joint Venture Agreement on Computerization

*18410183a Moscow IZVESTIYA in Russian
1 Mar 89 p 5*

[Article by A. Vasilyev under the rubric "Information for Business People": "Not Just for the Sake of Commerce"]

[Text] Another agreement on the creation of a joint venture has been signed in Moscow. This time the signatories were the Soviet Center for Interbranch Scientific Programs, "MENATEP," and the French company CSIS. The basic profile of the venture, computerization, is a matter just as important for us as it is profitable. By the way, it turns out that the president of the French company has more than commercial goals: No interpreter is needed to talk to Serge MAZHAROV.

"The fact is that I was born in Moscow, and although I was educated in France, where I went with my parents at the end of the 70s, I cannot observe the changes happening in Russian from the alien viewpoint of a foreigner.

"I'm not a politician. I'm a specialist in precise numbers—computers, their software. I'm an entrepreneur. And it is from this standpoint that I see the opportunity and need to apply my knowledge, strength, and resources to solving the problem of computerizing the USSR. I can confidently say that the computer as storage for all accessible information may become one of the tangible guarantees of glasnost. Only highly sophisticated equipment will in turn make it possible to solve complicated economic problems.

"Our company was founded just two years ago. It engages in buying, selling, and assembling personal computers, as well as software for large IBM computers. I know the seriousness of the USSR's problem of the burden of imported computers, which are used at nowhere near full capacity. Aid in solving this problem will come from programs whose development will be the main thrust of the joint venture's activity.

"I'm sometimes told that in this case I got involved not just for simple business, that it would have been must simpler and more profitable to sell computers. This is indeed true. Developing programs brings somewhat less profit than buying and selling.

"But it's not just a matter of commerce, although as a businessman I can't hide the fact that I'm attracted by the opportunities of the Soviet market. The fact is that I believe that a former compatriot is not necessarily a former friend. He must approach the problems of his homeland not with commercial yardsticks alone. There are quite a few businessmen born in the USSR but now living and working in the West. In the near future we intend to join in an association whose goal is the transfer

our knowledge and experience in international trade to our Soviet colleagues, to do whatever we can to help Russia solve the economic and culture problems she is facing.

"By creating a joint venture in Moscow, I have already virtually acted in accordance with the association's goals."

Development of PRC Computer Industry Examined

*18140189 Moscow SOTSIALISTICHESKAYA
INDUSTRIYA in Russian 4 Mar 89 p 3*

[Article by M. Kazakov and A. Nemets: "Lengthwise Along Electronics Street." Passage in italics as published]

[Text] *One day Gao Juan suggested a new type of electronic microcircuit to the chief. Turning inadvertently on leaving the office, he noted with sadness how the chief threw his creation into the basket. Then Gao thought that he would soon be 40 years old and should leave the academic scientific research institute, where he had been valued somewhat highly until recently. But where would he go? Throughout all of China, new cooperative cafes and cafeterias had sprung up by the hundreds. His first thought was to abandon electronics altogether, and become the owner of yet another cook-shop. The engineer spent several weeks in this mood. Then, an honorarium of 150,000 yuan for a device developed by him for predicting earthquakes "fell" from heaven. And the "Beifang" ("North") Company was born—today one of the most noteworthy companies on "Electronics Street" in the Peking Rayon of Haidian.*

Gao's story is very reminiscent of the reader-book legends about an American boy who earned his first dollar by cleaning boots, and then added the million of a very opportunely deceased uncle to it. For the "collective" scientific and technical companies of China, called people's because they made do without state credits when they sprung up, this story is almost exceptional. However, it nonetheless occurred. The high skill and initiative of an ambitious and still fairly young Chinese assured its continuation.

Incidentally, almost all of the leaders of the "collective" scientific and technical companies created in recent years are people just barely over the age of 40. Their ascent of the Olympia of enterprise was not smooth. In 1985, during the "thaw" in the Chinese economy, when higher growth rates were accompanied by tempestuous inflation, a wave of prosecutions swept the country. Sometimes with very severe sentences. Finally, this punitive campaign, from which the most significant figures were pulled out through the personal interference of country and party leaders, played out rapidly. Today, the "collective" scientific and technical companies in

China are surrounded with special attention. The average Chinese, it seems, has already realized that they are the main motor of technological revolution.

In the early 1980s, a large group of computer hardware specialists from the United States visited China. Then I. Auerbach, publisher of the multi-volume, continuously renewed "Computer Technology" reference, went there.

The delegation's summary report and Auerbach's report, published in *COMPUTER* magazine, give a sufficiently detailed picture of the early 1980s. At that time, China had already produced more different computer models than our country. They were analogues of the world's most popular computers, created by American corporations. In May 1983, the manufacture of the "Silver River" supercomputer was completed. After 6 months of testing, a Chinese "Cray" with a performance of 100 million operations per second was obtained. It even looked like the American prototype externally. When series production of a domestic version of the MicroVax 11 computer—one of the world's most complex—began at the end of 1987, among the subdivisions on this project was a subdivision of Digital Equipment Corporation, which created this remarkable computer.

Americans, who strived in trips through China to discover on what account this "beast from the sea" had arisen, asked one and the same question everywhere: what kind of supply of literature, of specialized English-language publications is there? They received an answer—300, 400, 200 journals. Obviously, the people who make decisions in China fully understood that progress begins with familiarizing young people with new ideas. Incidentally, let us note that some of our "head" scientific research institutes for computer problems do not even receive a single "hard currency" journal. They are even gradually taking away first one slipper, then the other from our main Cinderella—the State Public Scientific and Technical Library.

After ideological doctrines in Chinese society stopped pressuring the economy, the work of specialists in computers differs little from that of their colleagues in the U.S. They have significant social prestige, job satisfaction, and proper compensation. Whereas in 1985 the export of computers and parts to the U.S. from China comprised less than 400,000 dollars, after 2 years it has grown by a factor of 100!

True, many authorities claim that China is still far from the process, established in the U.S., of planned obsolescence of production, forcing millions of engineers to swiftly develop new technologies. However, it is probably better to measure a phenomenon by the distance crossed, not by a point that is truly remote for the present time.

For several months at the end of last year, personal computers from the "Beifang" Company functioned at the VDNKh [All-Union Exposition of the Achievements

of the National Economy]. Any author or simply the possessor of a computer program, visiting the NTTM [Scientific-Technical Creativity of Youth] exhibit for Moscow and Moscow Oblast, could put his diskette in a computer and discuss its contents with his colleagues. Later on, most likely, one begins to think... How did the Chinese, who 4 years ago were in approximately the same crisis in computers, as we are today, turn out to be among the world leaders within a very short period of time?

One of the most famous Soviet experts on the world computer market, Aleksandr Giglavy, leading scientific associate, USSR Minpribor Institute for Electronic Control Computers, helped me find an answer to this question. Recently, he has also been working as a consultant for a Soviet-Chinese enterprise, "Beifang-Moskva," which produces personal computers and automated design systems.

Zhanguancun ("Middle Gate Street") in the southwestern Peking suburb of Haidian began turning into "electronics street" in 1980. Large-scale reforms began in the country. A group of specialists from the largest region of concentrated intellectual forces in China (50 leading VUZs [Higher Educational Institution] and 138 scientific research institutes are located here), headed by Chen Chunxia, an Academy of Sciences Institute of Physics graduate student, created a "department for maintaining and developing advanced equipment." This was the first scientific and technical enterprise, which set transplanting the operating principles of California's "Silicon Valley" to Chinese soil as its goal.

Soon similar companies, begun, as a rule, with very little starting capital which was borrowed from somewhere, began to grow like "bamboo shoots after a rain." After about 4 years, 148 scientific and technical companies with the status of legal entities had appeared on "Electronics Street": state, cooperative, private and those based on mixed capital with foreign participation. More than 80 percent of the production of these companies consisted of various kinds of electronics and computers. According to report data on 43 companies, their sales calculated per employee amounted to 60,000 dollars, and the profit was 12,000, which is close to the indicators of large American companies specializing in computer equipment. More than three-fourths of the developments created on "Electronics Street" were introduced in under a year. Thanks to the involvement of small- and mid-sized enterprises in setting up the series production of output, innovations spread rapidly throughout China.

In time, the level of the developments increased, and the number of programmers from all parts of the country instructed at Haidian and the circulation of the specialized literature published here, grew. For every computer sold, 2-3 trained specialists are needed. Moreover, the

largest computer marketplace in China has been formed on "Electronics Street," the activeness of scientific and technical workers has increased sharply, and their standard of living has risen.

Three-fourths of the "Electronics Street" specialists surveyed by a government committee stated that they work at full capacity here (this indicator is much lower in universities and scientific research institutes). The overwhelming majority reported that their incomes more than doubled after transferring to a company. In general, the development of the "street" has taken a strike at the old views and the old structure, which isolate science and technology from the economy. The source of the great dynamism of the young scientific and technical companies was their economic independence and their freedom in selecting cadres and seeking business partners.

The most impressive results were achieved by a group of specialists, who created the largest "collective" scientific and technical company in China, "Stone," on "Electronics Street" in 1984. Wan Runnan, founder and head of the "Chinese IBM," former associate of the national Academy of Sciences Computer Center, stated in a GUANGMING RIBAO interview: "There are political leaders, soldiers, scientists, and literati in the PRC, but there are no entrepreneurs. If enterprise leaders do not start answering for their management actions directly to the enterprise itself and its employees, no sharp upsurge in the economy will occur." Working with text processing systems, "Stone" went from sales of 10 million yuan to 240,000 million in 4 years.

At first, electronic systems for processing hieroglyphic writing were imported from Japan and equipped with Chinese software. But in 1986 "Stone" created one of the world's best electronic systems—a combination of an IBM PC personal computer and a printer. The price of this electronic printing system was several-fold lower than that of the existing Chinese or imported computer. Orders for the computer, which to this day is being produced in Japan, came in by the thousands. A few months after the appearance of the innovation, the young company already had its own scientific research institute and an experimental plant, besides 60 sales centers throughout China. In December 1986, the central press began actively propagandizing the experience of "Stone." After another half-year, the construction of a plant for mass producing assemblies for "Stone" computers began in Peking suburb. For the first time, a Chinese company, cooperating with foreigners, made its own contribution through technology, not money.

Having begun by importing Japanese personal computers, compatible with the IBM PC, but costing less by a factor of almost 2, in the course of several months the company prepared its own models of the XT and AT class computers and began the small-series production of them.

By the middle of last year the corporation, only 14 years old, already had 22 specialized companies, 18 departments, 600 stores, 4 joint enterprises and 5 leased state plants. The rapid growth in sales was accompanied by a reduction in prices for the corporation's goods by an average of 10-20 percent annually. Whereas a PC/XT class personal computer, assembled by "Stone" enterprises, basically out of imported parts for the time being, cost 11,000 yuan in September 1987, the price dropped by one-fourth in under 4 years.

Today, the Chinese press is seriously discussing the influence of "Stone" on the development of science and technology, the economy, the political system and even on traditional attitudes towards culture. Sayings that "Stone" is the touchstone of the Chinese reform are well-known.

In its first year of existence, "Beifang" sold PC/XT and Apple type personal computers to schools and VUZs, adding a large set of educational programs to each computer. It then began small-series production, made from imported units, of the improved PC/AT class computers, selling them at a record low price for China at the time. Quite soon after the delivery of individual computers, the path was crossed to supplying local networks consisting of several computers with original software, and automated design systems with 3-dimensional computer graphics. At the same time that most competitors had focused on 16-bit computers, "Beifang" concluded an agreement with American corporations and began selling 32-bit U.S. computers on the Chinese market with their own software. As a result, its original systems for design and production automation have become fairly widespread. Later, having outpaced the leading institutes and plants of the Chinese Ministry of the Electronics Industry by nearly a year, the cooperative company put out its own 32-bit personal computer, similar in terms of features to the high-end IBM P/2 series models (2 weeks before it was released by IBM). Export began almost immediately, which brought the computer a good reputation in East and North European countries... For the present, the company still buys Japanese CRTs and hard disks (the basic information media). However, it makes all of the controlling electronics itself.

The Chinese are doing good business not only in broadly used technologies, but also in technologies which today are still only being prepared for market release from the laboratories and institutes of the United States, Japan and West Europe. Right after the Japanese, a group of specialists, led by Professor Wang Peizhun of the Peking Pedagogical Institute, created a computer which operates on the principles of so-called "odd logic." That is, a great step has been taken toward making the computer's "way of thinking" closer to human thinking. The Chinese model has an operating speed greater than that of the Japanese by a factor of 1.5. It has also tested out better in tests for controlling technological processes.

So, what do we have? Currently, we have not even publicized the figures for the output of personal computers broken down by categories, models and years, as is done in the U.S., Japan and now in China. Of the known hundreds of thousands, it is unknown of what models, by whom they were produced, and who they were delivered to. Above all, we need this so as to not build false illusions and to realistically plan our own actions. Might it be worth not being too lazy about sending a group of

specialists (not bureaucrats!) to China for on-site study of that which is taking place there? And to send them, just as the Americans sent their own people—for a fairly long period of time? Moreover, the observations of this group should be published in the broad mass press, not just in the specialized press.

For some reason, we are all still ashamed to study seriously!

Tajik Academy of Sciences Discusses Basic Research, Ethnic Issues

18140177 Dushanbe KOMMUNIST TADZHIKISTANA
in Russian 24 Jan 89 p 3

[Article (TADZHIKTA): "For Science a Qualitatively New Level"]

[Text] As has already been reported, the general assembly of the republic Academy of Sciences was held on 20 January in Dushanbe. The tasks, which were posed for scientists by the decisions of the 19th All-Union Party Conference, were discussed at it.

In the basic report, which President of the Academy of Sciences of Tajikistan S. Kh. Negmatullayev delivered, it was noted that the changeover of scientific institutes to the new system of financing and to self-support [samook-upayemost] is urgently posing for the basic units of the academy the task: to specify clearly their priority directions and to concentrate scientific forces and material resources on them. For this each scientific institution should evaluate the state and level of the basic research being conducted, study the use of its results in the national economy and the forms of contact with production organizations, and weigh the potentials of supporting basic and applied research. It is necessary to determine the advisability of the existence of unpromising and poorly operating structural subdivisions.

The present stage of restructuring is making increased demands on personnel, especially on the management unit. S. Kh. Negmatullayev told about the forthcoming changes in the system of management of academic science of the republic and dwelt on the change of the procedure of filling management positions at institutes of the academy. The participation of scientists themselves and labor collectives in the discussion and settlement of personnel questions and in the democratization of scientific life has been broadened substantially. At many institutions the election of directors has already been held, the formation of scientific councils on a democratic basis has also taken place.

Considerable space in the report was devoted to steps on the strengthening of the material and technical base of the academy. The allocation of additional assets for the acquisition of equipment, scientific and measuring

instruments, electronic computer hardware, and other hardware is envisaged in conformity with the protocol, which was recently signed by President of the USSR Academy of Sciences G. I. Marchuk and Chairman of the Tajik SSR Council of Ministers I. Kh. Khayeyev. It is planned during the 13th Five-Year Plan to build an academy campus in Dushanbe, for which the necessary limits of capital investments are being allocated.

The speaker also dwelt in detail on the priority directions of the activity of the Physical, Mathematical, Chemical, and Geological Sciences Department, as well as the Biological Sciences Department.

G. A. Ashurov, academician secretary of the Social Sciences Department, devoted his report to the tasks of the social sciences under the conditions of restructuring. He stressed the necessity of the development of sociological research in the republic at a qualitatively new level, which will contribute to the better solution of the urgent problems that now exist. Much space was devoted to the role of scientists in eliminating the significant problems and distortions, which exist in current works on the history of the Tajik people.

The speaker focused basic attention on the problems in the sphere of international relations. Only now, under the conditions of democratization and glasnost, has the scientific community obtained the opportunity to focus on the study of their causes.

Corresponding Member of the Tajik SSR Academy of Sciences D. Kh. Karimov, who then delivered a report, focused attention on the basic directions of the restructuring of regional economic research.

R. M. Masov, director of the Institute of History, Archeology, and Ethnography imeni A. Donish, I. A. Abdusalyamov, director of the Institute of Zoology and Parasitology of Animals, Academician of the Tajik SSR Academy of Sciences G.A. Aliyev, and other scientists, who delivered reports for the purpose of discussion, covered specific questions of the increase of the contribution of academic science to scientific and technical progress in all spheres.

The assembly adopted a detailed decision on the discussed questions.

Candidate for People's Deputy Promises To Change Secrecy Policies

18140179 Moscow SOTSIALISTICHESKAYA
INDUSTRIYA in Russian 21 Feb 89 p 2

[Interview with Honored Inventor of the Ukraine Boris Ivanovich Sushko, a smelter of the Order of Labor Red Banner Svetlovodsk Plant of Pure Metals imeni 50-letiya SSSR, by G. Androshuk, chief of the Sector of Technical Creativity of the Ukrainian SSR Trade Unions Council, under the rubric "We Are Heading for the Election" (Kiev): "The Platform of the 'Disturber of the Peace'"; date not indicated; first two paragraphs are SOTSIALISTICHESKAYA INDUSTRIYA introduction]

[Text] In conformity with the Law "On the Election of USSR People's Deputies" five people's deputies will be elected from the All-Union Society of Inventors and Efficiency Experts. Among the candidates is Honored Inventor of the Ukraine Boris Ivanovich Sushko, a smelter of the Svetlovodsk Plant of Pure Metals imeni 50-letiya SSSR. A highly skilled specialist in the area of the equipment and technology of semiconductor materials, he has been working more than 40 years at enterprises of nonferrous metallurgy. The last 26 years have been at the Order of Labor Red Banner Svetlovodsk Plant of Pure Metals.

Here is what he related at the request of our editorial board.

B. I. Sushko: We have become accustomed to the popular phrase that we live in the age of the scientific and technical revolution and the triumph of scientific and technical progress, Boris Ivanovich says. But in reality the "cart" of this progress is moving slowly, and it is a pity that our country hold far from the key positions.

SOTSIALISTICHESKAYA INDUSTRIYA: You are the author of 54 inventions, many scientific publications, and more than 30 efficiency proposals. The total economic impact from the use of your inventions comes to 2.5 million rubles. If one person can do so much, why do we talk about a lag?

B. I. Sushko: The whole point is that the inventor in our country, which is as unique as possible, remains a person on his own. Thousands of present-day Kulibins and Cherepanovs for years camp on the doorstep of high instances and their ideas become obsolete. One must not calmly contemplate such a situation further.

SOTSIALISTICHESKAYA INDUSTRIYA: Do you intend to use your high credentials to fight for the radical improvement of affairs?

B. I. Sushko: I do. If they put confidence in me. I understand that this is a high honor and an enormous responsibility not only for me personally, but also for our entire organization, which is sending its own representatives to the highest organ of power of the country.

SOTSIALISTICHESKAYA INDUSTRIYA: You probably have specific plans, which are based on your experience as the manager of a multiple-skill creative brigade of innovators and an active member of the All-Union Society of Inventors and Efficiency Experts, do you not?

B. I. Sushko: Actions should be only concrete, because there was much talk, but little work. The All-Union Society of Inventors and Efficiency Experts as an organization should give direct assistance to the inventor along the entire chain, which includes the submitting of an application for the invention, its patenting and publication, the search for an organization, which is interested in use and assumes the expenditures on the introduction of the invention, and its use by the maximum number of state and cooperative organizations.

SOTSIALISTICHESKAYA INDUSTRIYA: Does your election platform reflect the interests of inventors?

B. I. Sushko: Certainly. I consider it necessary to achieve at the state and legislative level deductions of approximately 10-15 percent of the saving from the introduction of inventions of the All-Union Society of Inventors and Efficiency Experts for the organization and financing of temporary creative collectives and for the development of advanced ideas and proposals, which do not have analogs and ensure a breakthrough of scientific and technical progress in the country. Now, as you know, these interdepartmental problems, not having a client, are getting bogged down in numerous consultations and, as a consequence, are not being accomplished.

SOTSIALISTICHESKAYA INDUSTRIYA: In fiction the imagine of the inventor in the role of a disturber of the peace, who in pursuit of fame and recognition does not take departmental interests into consideration, has already become boring. What do you think of this?

B. I. Sushko: I believe that this is no cause for joking. One of the factors of deceleration is the classification of scientific and technical information by departments. There are many reasons for this—the low level of equipment and technology in one ministry or another, the reluctance to put on general review one's own possibilities and developments, therefore, both initiative and, let us face it, the deliberate concealing of the state of introducing work, calculations of the saving, and the received rewards are punishable. Of course, under such conditions the inventor is a potential opponent of departmental policy. Secrecy is the most serious obstacle of scientific and technical progress in the country. I will try to see to it that the degree of secrecy of inventions would be determined by a single state organ—the State Committee for Inventions and Discoveries—with the enlistment of the All-Union Society of Inventors and Efficiency Experts as the party which represents the interests of inventors. That is, the degree of secrecy of applications for an invention is to be determined at the extradepartmental, state level.

SOTSIALISTICHESKAYA INDUSTRIYA: Restructuring has afforded new opportunities. How are they being used?

B. I. Sushko: We can now gain time in the mutual enrichment with ideas. It is necessary to develop international scientific and technical cooperation and to establish joint ventures and temporary creative collectives made up of specialists of various countries. Suggestions are now coming to us from all corners.

SOTSIALISTICHESKAYA INDUSTRIYA: Boris Ivanovich, do you think inventors can influence substantially in the next few years the solution of problems of ecology?

B. I. Sushko: Of course. They themselves live in this far from optimum environment. Here I propose first of all to stimulate the development of ecologically clean products and technology. It is necessary to hold competitions for the selection of ecologically clean inventions and efficiency proposals on a state scale and to organize their extensive duplication.

SOTSIALISTICHESKAYA INDUSTRIYA: Let us proceed to the draft of the Law on Inventive Activity. In the history of civilization inventions always played the role of a lever of progress.

B. I. Sushko: However, in our society, especially during the period of stagnation, the social status of the inventor declined. In the draft of the Law on Inventive Activity in the USSR, which is now being discussed, the rights of inventors and efficiency experts, unfortunately, are merely declared. There are no social and public guarantees of their realization. The role of the All-Union Society of Inventors and Efficiency Experts—the only organization which defends the rights of inventors and efficiency experts—is not reflected at all. The draft for the present is shoddy.

SOTSIALISTICHESKAYA INDUSTRIYA: The rectification of the formed situation in many respects depends on young forces. You have personally trained 9 inventors and 23 efficiency experts. Did they inherit your spirit, qualities as a champion, and civic spirit, and not only professionalism?

B. I. Sushko: I would like to think so. We should be concerned about the replenishment of the innovation bank with ideas of young people, give freedom to their creativity, and create the conditions for this. All the conditions—from living conditions to creative conditions.

Botanical Institute Director on Staff Reductions, Ecology Research

Kiev **RADYANSKA UKRAYINA** in Ukrainian
15 Jan 89 p 2

[Interview with Academician, K. M. Sytnik, Director of AN USSR Botanical Institute imeni N.G. Kholodnyy by correspondent Ye. Krasnovskiy under the "Meeting on Your Request" rubric: "Academician Sytnik: 'We Are Indebted to the People'"; first paragraph is **RADYANSKA UKRAYINA** introduction. Passage in boldface as published]

[Text] "Radyanska Ukrayina" readers have asked many times to meet Academician, AN USSR [UkSSR Academy of Sciences], Director of AN UkSSR Botanical Institute imeni N.G. Kholodnyy, winner of the USSR and UkSSR State Prizes, K.M. Sytnik. We are carrying out their wishes.

RADYANSKA UKRAYINA: Even "mere mortals" can see that not everything is all right with the environment. However, probably only scientists can paint an integral picture. What is your personal assessment of the current situation?

K. M. Sytnik: In my opinion, a poet has characterized it concisely and to the point. Remember: "There is less and less of Nature, more and more of environment." But let us switch to prose: the ecological crisis that mankind is experiencing is not the first one. However, if in the past crises were local and only touched individual people and self-contained territories; the current crisis is global and literally threatens everybody. The cause of this situation is clear. It seems that mankind, in its desire to subjugate time and space, has set a goal to use in its day-to-day practice—the motto of the Olympic's: "Faster, stronger, and higher." And in doing so, it forgets F. Engels' wise warning: "But let us not get carried away by our victories over Nature. It takes vengeance on us for each such victory." Indeed: why not rejoice at the fact that modern aircraft have overcome the sound barrier? But what should be one's attitude toward the fact that when crossing the Atlantic a jetliner burns approximately 35 tons of oxygen?

RADYANSKA UKRAYINA: But what is the alternative? Go back to windmills, as proposed by our readers because of the environmental harm caused, for instance, by nuclear power plants?

K. M. Sytnik: No, why? One cannot stop technical progress. However, as far as I am concerned, one can always find the most rational way to achieve one's goals. For instance, one could solve the problem of supplying food to the population by continuously expanding areas under cultured cereal crops and using chemicals to increase the yield. But there is another alternative - improve the utilization of Nature's generous pantries.

For instance, out of 250 thousand of species of flowering plants, over 3,000 are currently considered food plants, but only under 300 species are used.

RADYANSKA UKRAYINA: So how can one explain the passivity you are talking about? Indifference? Or habitual idleness? Do you remember the recent classification of our society by N.N. Amosov: the "elite" at the top and "loafers" below?

K. M. Sytnik: I can only share this point of view with certain qualifications. The majority of members of our society have forgotten how to work, they do it halfheartedly. So why people, who are literally able to perform miracles, have become indifferent to the results of their work? One cannot get away with just ascertaining the fact. It is impossible to live in a society and be independent of it. This fully pertains to science too. Its current status is first of all the result of the negative phenomena that were typical of the stagnation period. Moral principles were often violated in the formation of scientific collectives too. Often people far removed from science, those who wanted to get a snug job and high salary while producing a minimum payoff, were getting into these collectives. So the primary task of perestroika in science is to get rid of such "scientists". I will not talk about others, but I am sure that if in a number of departments of our Institute one cuts the payroll by 30 to 50 percent and creates optimum conditions for creativity for the remaining employees, the science will but win.

Science is harmed very much by the commanding-administrative work style that has gained a foothold in our life. Scientists too are given targets; they are required to work first of all on problems with a fast payoff. And what do you know? Scientists are forced to adjust - put aside comprehensive basic research and work on secondary nonessential subjects, in order to avoid being reproached for inactivity. Why then wonder that we still do not have a theory of perestroika? How could it have been created by people who have been deprived of the possibility to work for a long-term perspective? Under such conditions even Einstein himself would have hardly been able to say something new! One can ask: "Where is the warranty that long-term research will not in the end turn out to be a waste?" In light of this I would like to remind you of a joke. A scientist was asked to name the cause of a machine's breakdown. He had been circling the machine for some time, and then hit it with his fist - and the machine started. "How much do you want for the repair?" he was asked. "A thousand rubles". "Does a punch cost that much?" "The punch costs one ruble. I charge the rest for knowing where to hit".

RADYANSKA UKRAYINA: Can't one attribute the ecological situation to the fact that we often hit not where it is needed?

K. M. Sytnik: Exactly. Let us say, nowadays, in order to avoid fuel deficit, we use ever more oil, natural gas and coal - nonrenewable resources. Is this smart? I am sure it

isn't. I am sure that the mankind already can get the necessary amount of fuel from the vegetable kingdom, if only one would better utilize its capabilities.

RADYANSKA UKRAYINA: Our conversation will be illustrated by a photo by newspaper's reporter Ya. Davidzon showing your meeting with cosmonaut G.M. Grechko. If it is not a secret, what was the cause for his visit?

K. M. Sytnik: It is well known that he participated in conducting space biological experiments during an orbital flight. The methodology of these experiments had been developed at the AN UkSSR. Georgiy Mikhaylovich is a winner of a UkSSR State Prize in the field of science and technology; he is an author of the cycle of works on studying the mechanisms of growth and development of microorganisms under space flight conditions. So during our meeting we discussed our future plans.

RADYANSKA UKRAYINA: This is how our conversation, which started with purely botanical problems, switched to problems of cell engineering, space biology, ecology and environmental protection. Well, probably this is natural. Everything in our world is so interrelated. And a real scientist cares about everything.

In the photo (left to right): Department Head, AN USSR Botanical Institute imeni N.G. Kholodnyy, Doctor of Biological Sciences Ye.L. Kordyum, Twice Hero of the Soviet Union, Pilot-Cosmonaut of the USSR G.M. Grechko, Senior Scientific Associate, Institute of Medical and Biological Problems, USSR Ministry of Health, O.L. Mashinskiy, Academician, AN UkSSR, K.M. Sytnik and Senior Scientific Associate G.S. Nechitaylo.

Kurchatov 1955 Letter Attacking Lysenko Published

Background on Incident

18140184 Moscow PRAVDA in Russian 13 Jan 89 p 4

[Article by R. Kuznetsova, I. B. Kurchatov House Memorial Museum, under the general headline "Genetics Is Our Pain": "From the Archives of Academician I. V. Kurchatov"]

[Text] Interest in the personality of the outstanding Soviet physicist Igor Vasilyevich Kurchatov has not abated. No matter how much has been written about him before, time and history reveal ever newer unknown pages in his biography. Even his personal files still hold secrets.

With this publication we would like to describe one side of this multifaceted leader little known to the general audience—physicist Kurchatov's struggle with Lysenkoism.

After Academician N. I. Vavilov's arrest in 1940, the leadership of agricultural science in the USSR and, after 1948, all biological science, was in the grip of T. D. Lysenko. At the meeting of VASKhNIL [All-Union Academy of Agricultural Sciences imeni V. I. Lenina] in August, 1948, Lysenko declared all the ideas and works of his opponents "outside the law," false science, and departures from Darwinism that belonged to "Weismannism-Mendelism-Morganism."

While the August VASKhNIL meeting was condemning the works of progressive biologists and banning genetics as a science, I. V. Kurchatov had already started up his first commercial plutonium production reactor. In the Urals he was working on the study of the ionizing emissions that occur during radioactive decay. It was important to know how they affect a living organism in order to learn to preserve the health of a person working with radioactivity.

I. V. Kurchatov had organized this work on the Moscow site in 1947, after he had started up the first physics reactor in laboratory No. 2 in December, 1946.

As a physicist, Kurchatov understood the importance of the biological experiments being performed. In the search for the truth, Igor Vasilyevich "puzzled" not only others, but most of all himself, tirelessly studied, and when he was convinced that he was right, went on the offensive acting decisively and boldly. He met different people. They say that he understood them well. He helped many, even when they didn't ask. But he was merciless toward disorder, mercantilism, the status quo, to pretentious boasters and tricksters, to "representatives of science."

Kurchatov included Lysenko in this group. After determining his attitude toward Lysenko's "teachings," Igor Vasilyevich entered the struggle.

Lyudmila Nikiforovna, the wife of Igor Vasilyevich's brother Boris Vasilyevich, related what I think is an interesting episode demonstrative of Kurchatov's rejection of Lysenko's ideas. January 12, 1953 was Igor Vasilyevich's 53rd birthday. The day was celebrated at the "woodsman's hut," a house on the institute's property where the Kurchatovs live in Moscow. Relatives, friends, and comrades came—each with a gift.

Boris Vasilyevich had gotten hold of a little box inside which was a small jade frog sitting on a jade lily pad. It is now kept at the house among the museum's exhibits. The frog turned out to have different eyes—one was like a pearl; the other, half open, was red. This difference in eye color was an obvious allusion to the capacity for mutation.

Kurchatov love gifts with a meaning. Looking at the frog with his guests and evaluating the experiment performed on this classic object of research, he talked about biology and genetics. Lyudmila Nikiforovna asked why Igor

Vasilyevich was discussing the issues with many scientists from different disciplines without calling Lysenko. Igor Vasilyevich curtly answered, "Why do we need him?"

Even then underground researchers were working in one of the physics sectors at the Instrumentation Laboratory (as the Institute for Atomic Energy was called in the early 50s). Understanding that immediate and decisive measures were needed to broaden radiobiological research, Kurchatov went into action. As a member of the presidium of the USSR Academy of Sciences, he succeeded in having a serious review of the issue there.

After several biologists who opposed Lysenko had sent letters to the CPSU Central Committee about the abnormal position of biology in the country, articles began to appear in the press to initiate discussion. Igor Vasilyevich was assigned to prepare a detailed letter to the CPSU Central Committee which would describe the appalling position of domestic biology. One day possibly during that time, laboratory staff member Yu. L. Sokolov, who was in Kurchatov's office, became an unwitting witness to a telephone conversation between Kurchatov and Lysenko. "Kurchatov was more than upset. Passions raged in the receiver, which Igor Vasilyevich held at arm's length—it was so 'energized.' The uninterrupted speech lasted about an hour. Occasionally Igor Vasilyevich, putting it to his ear and trying to remain calm, said only one thing: 'Everything's already decided,'" recalls Yuriy Lunich.

Possibly sensing that a storm was brewing, Lysenko tried to disperse the clouds gathering over him.

A copy of a letter written in 1955 to the CPSU Central Committee has been found in Academician I. V. Kurchatov's files. Unfortunately, it is not signed, and we have so far been unable to establish who participated in preparing the document

In the second half of 1956, Kurchatov received a new, powerful push in his journey toward the truth. One summer day Academician Igor Yevgeniyevich Tamm came to him. "Always cheerful," recalls Kurchatov's comrade and scientific assistant in those days, I. N. Golovin, "He was upset about something that day. English scientists had succeeded in decoding the structure of DNA molecules, which meant that they could be duplicated and replicated. The curtain over the secret of inheritance had been opened a little. Tamm brought the news.

"The joy of learning of such basic scientific results achieved abroad was clouded for the group by the consciousness that our country was terribly behind in this discipline. It was a pity that the Soviet school of genetics, which had been a world leader in the 30s, had simply fallen behind and been utterly crushed."

Then they decided to organize a seminar. Kurchatov would hold it at the institute and invite outstanding scientists: I. Ye. Tamm, V. A. Engelgardt, A. N. Nesmeyanov, B. L. Astaurov, and others.

Igor Vasilyevich asked Tamm to give the first introductory lecture on the recent successes in biology. It is remembered that this was a brilliant lecture. Famous biologists A. A. Prokofyev-Belgovskaya and M. A. Peshkov described advances in genetics.

Kurchatov went to all the lectures like a student, took notes on the papers, listened to speeches, asked questions, untroubled by what he was studying. He had studied his entire life, keeping until the very end the joy of perception, the ability to learn and be surprised.

Supporting the biologists' petitions to the CPSU Central Committee, Kurchatov personally turned to N. S. Khrushchev. Igor Vasilyevich's comrade in the atomic industry, Ye. L. Slaskiy, a participant in one of Kurchatov's conversations with Khrushchev, remembers:

"In 1956 when I had become a minister, N. S. Khrushchev was First Secretary of the CPSU Central Committee. His relationship with Igor Vasilyevich was good. There were a lot of questions. Igor Vasilyevich came to me, 'Let's call, let him see us.' I called Khrushchev. He saw us immediately. At that time Lysenko had suppressed genetics. But Igor Vasilyevich decided to defend Dubinin, so off we went to Khrushchev. Khrushchev said, 'Igor Vasilyevich! We value and respect you highly! But you're illiterate here, don't mess in this matter!'"

"And then Igor Vasilyevich turned to me, 'Give me money! Order space to be built!' I did. They built the space and developed geneticists unbeknownst to Khrushchev."

Kurchatov continued to act. In March, 1957 on his initiative papers by Academicians A. P. Vinogradov, A. A. Blagonravov, L. A. Artsimovich, and Prof. A. M. Kuzin on the results of work done using isotopes and nuclear radiation were presented at a special meeting of the Academy of Sciences Presidium.

On Igor Vasilyevich's insistence a committee on radiobiology was created under the Academy of Sciences' presidium to coordinate the work and involve different institutes across the country in it. Kurchatov supported the idea of creating an Institute for Molecular Biology under the direction of Academician V. A. Engelgardt in the USSR Academy of Sciences system.

Kurchatov discussed the plan for creating a radiation cytology laboratory with future academician V. L. Astaurov.

Kurchatov decided to create a biology department at the Atomic Energy Institute. He told this to the head of the English Atomic Scientific Research Center in Harwell, his old acquaintance Sir John Cocroft, who came to visit Kurchatov in November, 1958.

Kurchatov signed the order to create a biology department in 1958. He gathered scientists from various disciplines—biologists, chemists, physicists, engineers—who worked on the physics of biopolymers and molecular genetics. In the initial stage Viktor Yulinovich Gavrilov was assigned to organize this department. He quickly converted it from a biology department into a radiobiology department, and in 1977 the decision was made to make it the independent Institute of Molecular Genetics and incorporate it into the system of Academy institutes. This institute gradually became one of the country's leading centers in molecular genetics.

The letter to be published, one of those commissioned by Academician Kurchatov, was discussed with him. It is dated May-October 1955, between the conference in Geneva on the peaceful use of atomic energy and the upcoming 100th anniversary of I. V. Michurin's birth. The text is somewhat abridged.

The content of the letter needs no commentary. In and of itself it is evidence of the appalling state of biological sciences in our country in the mid-50s and the roadblocks Lysenkoism erected to original research.

Text of Letter

18410184 Moscow PRAVDA in Russian 13 Jan 89 p 4

[Unattributed article under the general headline "Genetics Is Our Pain": "To the Presidium of the CPSU Central Committee—A Letter from 1955."]

[Text] Some of us who signed this letter have already gone to the CPSU Central Committee and expressed our viewpoint on the current state of biology in the USSR. Our critical opinions met a positive response in the Central Committee, and we were informed through local Party organizations that practical steps would be taken to correct the situation.

However, the serious consequences of T. D. Lysenko's monopoly on science have still not been eliminated, as a result of which Soviet biology and agricultural science on the whole are considerably below the level of development of world science.

The supervision of all agricultural science in the USSR and the Institute of Genetics of the USSR Academy of Sciences is in the hands of T. D. Lysenko; the Secretary of the Division of Biological Sciences of the USSR Academy of Sciences is, as before, Academician A. I. Oparin, who has actively helped strengthen T. D. Lysenko's monopoly.

Attempts to correct the situation, created normal working conditions, and stop forcing Lysenko's unacceptable statements on scientists and subjecting them to criticism by Lysenko's and Lepeshinskaya's henchmen are considered "revanchism" and suppressed as much as possible (for example, at the general meeting of the USSR Academy of Sciences in January-February 1955)...

We are approaching the 100th anniversary of the birth of I. V. Michurin, the outstanding Russian scientist and breeder, who set an example of creative work on the development of new forms of plants. The basic tenets on which Michurin based his many years of constructive activity are well known. There is a real threat that Lysenko's group will use Michurin's birthday, which can and must be an occasion for review of our biology's service to the Soviet people, to further falsify Michurin's scientific views, to use his name to defend the denial of the very basis of Darwinism and everything that has enriched science since Darwin. We are all genuinely perplexed by Lysenko's statement as speaker at the celebration meeting dedicated to Michurin. We believe that this may slow the recovery of biology and stifle freedom of discussion and criticism.

We need to judge the true role which Lysenko played in the Soviet people's life, primarily on the basis of practical results. The material losses which our country has suffered as a result of Lysenko's activity are so great as to be incalculable. This has been repeatedly said in the CPSU Central Committee and reported at various conferences and meetings. We will give only a few examples. Over several years, at Lysenko's order breeders were forced to work on experiments on "vegetative hybridization" and "altering the nature" of plants instead of real work on developing new strains. It was promised that these methods would quickly result in the creation of new agriculturally valuable strains (e.g. the alteration method would be used to create a winter wheat for Siberia in three years). However, the criterion of practice has irrefutably demonstrated the falsity of these theoretical premises: in 15-20 years, the "vegetative hybridization and alteration" methods have produced nothing of value.

Our country has suffered a tremendous loss as a result of Lysenko's struggle against the use of hybrids of inbred (self-pollinating) corn lines.

True patriot scientists like N. I. Vavilov were called on to use American experience for the good of the Soviet people. At meetings on genetics and selection convened by the editors of the magazine "Pod znamenem marksizma" in 1939 Vavilov described the derivation of hybrids of inbred corn lines as the greatest practical achievement of modern genetics.

Less than a year later Vavilov was arrested, the supervision of agricultural science in the USSR was transferred entirely into Lysenko's hands, and all work on introducing hybrid corn here was stopped.

As a result of Lysenko's activity, work on the study and use of polyploids (double the number of chromosomes) for breeding needs was stopped. In Sweden, East Germany, India, and several other countries this method has produced certified agriculturally valuable new strains of sugar beet, clover, rye, etc.

Lysenko played an equally negative role in protective forestry. Have the losses to our country as a result of the large-scale use of hill-drop planting in arid regions, which is still promoted by Lysenkoites been calculated? Nor can one forget the harm caused by Lysenko's attempt to introduce spring wheat in the Ukraine.

The many years of Lysenko's activity as head of agricultural science in our country have had other serious negative consequences for the national economy. To a significant degree he disorganized the whole of agricultural science, confused the system of seed growing and experimentation, and replaced the scientific fundamentals of agronomy with widely promoted but unfulfilled promises, whereby each new proposal was essentially a way to mask the failure of the previous one and avoid responsibility for it to the state.

Lysenko's practical proposals have been closely connected to his theoretical views. This is not the place for a scientific and methodological analysis of the entire system of Lysenko's attitudes, which he called "Michurin biology" and "Soviet creative Darwinism." We will discuss only two issues. Instead of modern Darwinism, Lysenko promoted a medieval one, disgracing Soviet science with the theory of the "origin" of species. He and his associate V. S. Dmitriyev and others agreed to statements that sunflowers are transformed into Orobranche, a pine into a spruce, rye into brome grass, etc. Lysenko publicly stated (in particular in a lecture to students at Moscow State University in the spring of 1955) that if various species of birds are fed wooly caterpillars, these birds would lay cuckoo eggs; the curricula for institutions included such anecdotal topics as the study of the transformation of the organs of ticks into the organs of flies (USSR Academy of Sciences Institute of Genetics), etc.

The "theory" of O. B. Lepeshinskaya and G. M. Boshyan, who recognized the development of Infusoria from hay extract, bacteria from crystals, fungi from antibiotics, mammal cells from grass cells, etc., is part and parcel with Lysenko's "theory."

Soviet scientists, diverting themselves from serious work, wasted a great deal of effort and paper in scientific journals to expose all these fantastic constructions. Now as a result of a discussion in 1952-1955 on Lysenko's "theory" of species formation, it has been completely rejected.

Lysenko's genetic views, which he counterposed to modern genetics, are essentially similar.

"Weismanism-Mendelism-Morganism" is a bogeyman thought up by Lysenko and his supporters. They created it under the pretext of the struggle with idealism to brand their opponents in any area of biology and to defame achievements in several biological disciplines: genetics, cytology, biocenology, ecology, etc.

Modern genetics is based on a huge number of precisely established facts. It has revealed several laws of inheritance and variability. Genetics is closely linked to other biological sciences and to agricultural and medical practice. Modern genetics, like any other science, is continuously evolving; old notions are replaced by new, more advanced ones that are more thorough and precise. It experiences crises, different points of view struggle within it, but the Soviet people needs this lively science.

Work by G. Mendel, T. Morgan, and other researchers laid the foundation for studying the material basis of inheritance. Their work was further developed by hundreds of scientists in various countries, including Soviet. The study of the material basis of inheritance and the role of the chromosome is one of the most important advances in natural science in the 20th century. It explains phenomena such as determining sex in most animals and plants, breaking down the traits in the progeny of hybrids, and phenomena of infertility and fertility in distant hybrids and makes it possible to control them. Numerous specific studies have demonstrated the role of the chromosome in phenomena of inheritance and trait development, and on this basis the participation of other cell components—cytoplasm, plasmids, etc.—in these phenomena was discovered.

In recent years quite remarkable results have been obtained in the biochemical genetics of microorganisms. They have made it possible to identify the mechanisms of biosynthesis in many important substances, including amino acids and vitamins. Highly active X-ray mutant penicillins have been derived, and the entire world production of penicillin is based on their use.

Research on the effect of penetrating radiation (which arises during radioactive decay) on inheritance is of tremendous importance. The USA is doing a great deal of work on this. The Geneva conference paid a great deal of attention to this subject, but not one Soviet paper was presented. We cannot do without genetic data and conclusions in analyzing the primary mechanism by which penetrating radiation acts.

The most notable practical results of modern genetics are the method for raising the corn yield by hybridizing self-pollinating lines, which is one of the many pieces of practical evidence of the accuracy of the basic tenets of genetics, as well as the method for producing polyploid strains of agricultural plants, which testifies to the tremendous practical importance of the study of the chromosome's role.

Modern genetics is one of the bases of evolutionary study; Darwinism is now unthinkable without genetics.

As a result of Lysenko's activity, which is a deception of the state unprecedented in history, genetics was actually banned and Darwinism falsified. Lysenko's "theories" have supplanted modern genetics in the curricula for genetics and in corresponding textbooks. The study of the material basis of inheritance and the practical conclusions emerging from it are being concealed from the Soviet people.

All Soviet scientists understand that recognizing the major discoveries and achievements in genetics over the past 60 years does not mean agreeing with the false and reactionary conclusions which certain foreign biologists and philosophers draw from its facts, just as they do from the facts in any other science. We have struggled and we will always struggle most decisively against claims of gene inalterability, of the absence of substance exchange in genes and against evidence of the evolution and combination of genes.

We also talk so much about the problems of Darwinism and genetics because the grave situation in these areas of biology has a negative effect on all biological disciplines. Experimental embryology is actually banned, the study of phytohormones, which was quite well developed here, but applied in practice abroad, has been excised from plant physiology. Investigation and familiarization with foreign work on the study of human blood groups has been curtailed, biochemistry lacks modern methods of genetic research, etc. If we don't take immediate steps to overcome the backwardness of Soviet biology in all these areas, it will inevitably lead to backwardness in the development of the national economy and medicine.

Over many years Lysenko has put forth false theoretical contrivances toward a new stage in the development of the dialectical-materialistic understanding of biological phenomena. In fact, Lysenko's views are a forced mixture of mechanicism and idealism with simply illiteracy. But his influence has been so great that many of our philosophers, instead of resisting him, began to adapt and "improve" well-known key tenets of the materialistic dialectic, trying to bring them into agreement with Lysenko's views. For example, the study of the role of the internal and external in development, the interpretation of the categories of necessity and accident, discontinuity and continuity, etc. were subjected to this "reworking," i.e., direct distortion.

Guides and references on philosophy ("Kratkiy filosofskiy slovar" [Concise Philosophical Dictionary] and "Dialekticheskiy materializm" [Dialectical Materialism] edited by G. F. Aleksandrov, the draft of the "Istoriya filosofii" [History of Philosophy] etc.) and the magazine "Voprosy filosofii" tried to use the statements

of T. D. Lysenko and O. V. Lepeshinskaya that contradicted science to illustrate the law of dialectics and the materialistic dialectic to disgrace modern genetics. All this harmed the prestige of Soviet philosophy.

Among all the natural sciences, biology has been in a unique position in our country. Admittedly, we know that attempts were made to achieve a similar situation in other disciplines of natural science. Such, for example, were the prolonged attempts of some of our philosophers and physicists who, hiding behind dialectical phraseology, tried to "supplant" the theory of relativity and quantum theory, i.e., the areas of physics which contributed the most to practice, namely the peaceful use of atomic energy and, on the other hand, atomic hydrogen weapons. But Soviet physics did not follow this path, and thanks to proper selection of the direction of work, it made the socialist Homeland a leader in the knowledge and use of the energy resources confined in the atomic nucleus. In biology, as a result of Lysenko's activity, we do not have hybrid corn, and according to the Americans' data, profits from its introduction completely pay back all the costs to manufacture atomic bombs.

How did Soviet biology and agriculture come to such a state?

Beginning in the mid-20s attempts were made to bind scientists with Lysenko's views through administrative methods. Lysenko's monopoly was finally confirmed at VASKhNIL's August, 1948 session. Only the conditions created in biology after the August session could explain the dissemination of G. M. Boshyan's "revolutionary theory" and the canonization of O. B. Lepeshinskaya's views. There was not one scientist in the discussion of O. B. Lepeshinskaya's "new cell theory" and review of her "factual material" at a combined session of the Biology Section of the USSR Academy of Sciences and the USSR Academy of Medical Sciences in 1950 who would decide to speak against her patently false constructs...

VASKhNIL's August session was organized under the slogan "bring science to solve essential problems posed by socialism construction, to strengthen the struggle with idealism in biology." Meeting these requirements was and is the honored and a joyous task of each Soviet scientist and of all our science as a whole. In its name we direct our letter to the CPSU Central Committee.

It is quite unfortunate that the entire specific content of Lysenko's and his supporters' contribution to the session's work and all their later activity not only did not coincide with the tasks facing our science, but fundamentally contradicted it. The session took place in an environment of servility to Lysenko, the cult of Lysenko, and in a spirit of conceit, nihilism and naked denial of all the achievements of foreign science and the best traditions of domestic science. Therefore, the August session led not to the flowering of Soviet biology and agronomy, but to their decline, the elimination of several scientific

disciplines, the falsification of many of its divisions (genetics, cytology, evolutionary studies, etc.), and the establishment of an Arakcheyev regime in its worst form.

Now, seven years after the August session of VASKhNIL, the claims made in Lysenko's speech, including claims of the inheritance of "acquired traits" as a basic mechanism in evolution and of the "adequacy" of inherited changes, remain experimentally unproven, while the session's practical recommendations led from failure to failure. At that session Lysenko set forth his theory of the "origin" of species, whose absurdity was proven during biology discussion in recent years. There too Lysenko's speech announced nature's lack of competition among species, and on this basis a method of hill-drop planting forest crops was proposed several months later. The groundlessness of this claim by Lysenko has been proven not only in theory, but also in practice. The value of what was said at the session to discredit N. V. Tsimin, who derived outstanding strains on the basis of *Agropyrum* wheats, is now entirely clear to everyone. Everyone knows Lysenko's results with branching wheat, which was promoted at the session as a crop which could bring about a genuine revolution in the grain problem. Everyone understands how much our selection has lost by rejecting polyploid method, which was discredited at the session.

The Party and government are paying exceptional attention to eliminating the monopoly of individual scientists, expanding scientific criticism, eliminating conceit and disregard for the achievements of world science, seeing in all this the security of the success of Soviet science. So far, however, there has been no radical improvement in biology. The main reason for this is the status of our biology personnel. As a result of the many years of Arakcheyevism, scientists who protested against this regime were removed from the leadership of institutes, departments, editorial boards, VAK, etc., and unprincipled people, often ignorant or simply dishonest, who naturally opposed the restoration of the environment in biology in every way, were put into leadership positions.

Party and state agencies, turning to these people for consultation on key issues in the development of the national economy and the planning of science itself, often obtained poor-quality information from them. These same people are educating young specialists and sending them into life ignorant of current world science and incapable of cooperating to overcome our backwardness. Some employees at scientific research institutes and especially vuzes who "floated" to the surface after the destruction of personnel which followed the August session, fear that after Lysenko's monopoly is eliminated their lack of knowledge of basic materials of the discipline in which they "work" or teach will be detected. Many serious scientists were silent and did not take part in exposing the false science, since they believed themselves to be morally defenseless because of the fact that after the August session they had to publicly associate themselves with Lysenko and Lepeshinskaya.

The system for judging the Stalin Prizes in 1948-1952, the elections to the USSR Academy of Sciences in biology, the acceptance of candidate dissertations, which stand on a low level, but are subordinate to state dogma, and the placement of scientific personnel on the basis of their loyalty to Lysenko have led to a deep decline in the morale of Soviet science, and to a large extent have corrupted young Soviet scientists and created a grave situation whose correction required serious efforts.

Lysenko's supporters labeled attempts to correct errors in theory and practice "revanchism," a revision of the decrees of the August session, the restoration of "Weismannism-Mendelism-Morganism" and "Malthusianism." Their struggle to maintain an Arakcheyev regime in biology is depicted as the struggle for science's affiliation with the Party (cf. the paper by A. I. Oparin, secretary of the Section on Biological Sciences of the USSR Academy of Sciences in "Izvestiya AN SSSR", biological sciences series, No. 3, 1955.)

Ideologues of imperialism are making extensive use of the current status of our biology for anti-Soviet propaganda. Capitalist countries have an extensive anti-Soviet literature entirely built on the use of the "biological material" continuously supplied by Lysenko and his supporters speaking on behalf of Soviet science. One of the techniques of this propaganda in the USA is to translate without commentary both the works of Lysenko himself (for example, his book "Nasledstvennost i ee izmenchivost" [Inheritance and its Variability] and that of his supporters (the translation of A. N. Studitskiy's article "Fly-Loving Man-Haters" with all the caricatures of the original in an American magazine).

Lysenko's numerous trips abroad as a "representative" of Soviet science have provided much food for anti-Soviet propaganda. It is enough to recall the incident in Karachi in connection with N. I. Nuzhdin's speech at the Pakistani Scientific Conference in 1954, or the shameful failure of I. Ye. Glushchenko at the 7th International Botanical Congress in 1950, where he demonstrated his ignorance of the most elementary genetic facts.

Consequently, discussion of Lysenko's activity as a person who has inflicted tremendous harm on the USSR's science and national economy not only represents important grounds for elevating Soviet biology and agronomy, but also has great international importance. Further measures must obviously be aimed at correcting the harm Lysenko's activity has done to our country.

On the basis of the above let us list certain measures we consider especially important:

1. An open statement by leading organizations that T. D. Lysenko's views, as expressed by him in the paper at the August VASKhNIL session, are his personal views, not a Party directive.

2. The restoration in the USSR of modern Darwinism, genetics, and cytology, both in selection and scientific research work and in teaching in vuzes and secondary schools.
3. The training of personnel who have mastered modern methods of biological research, especially in genetic and cytology, on a scale that ensures that we can overcome our lag behind world science.
4. The replacement of the leadership of VASKhNIL and the conversion of VASKhNIL into a genuine scientific institution managed by its board.
5. The replacement of the leadership of the Biological Sciences Division and the Institute of Genetics of the USSR Academy of Sciences.
6. A review of the makeup of the editorial boards of biological and agricultural journals, as well as of the biology editorial board of the "Bolshoy Sovetskiy entsiklopedia."

We sign this document on the status of Soviet biology with a feeling of pain and bitterness. Even stronger, however, are our feeling of responsibility to the Soviet peoples and to the Communist Party, to which we are obliged to tell the truth, and our profound faith that the Party and the government will help Soviet biology emerge from its current position and, like other disciplines of natural science, fully contribute to the great task of building a communist society.

Commentary, List of Signatories

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[Article by V. Aleksandrov, doctor of biological sciences, professor, and D. Lebedev, learned secretary of the USSR Academy of Sciences Committee on Preservation and Development of the Scientific Legacy of Academician N. I. Vavilov: "This was 'A Letter of Three Hundred': Returning to What Has Been Printed"]

[Text] With excitement and profound satisfaction we saw the letter of the group of biologists to the Presidium of the CPSU Central Committee, to which we have a most direct relationship, published for the first time in the January 13 "Pravda."

The introductory article by R. Kuznetsova contains previously unknown materials testifying to I. V. Kurchatov's great services in the struggle with Lysenkoism. However, the history of the letter itself is presented inaccurately, and it is our duty to tell it as it actually was.

The scheme for the collective petition to the CPSU Central Committee arose in the USSR Academy of Sciences Botanical Institute imeni V. L. Komarova, and this was no accident. In the 50s, the institute, whose director was P. A. Baranov, corresponding member of the USSR Academy of Sciences, was the center of the

struggle with Lysenko. The "Botanicheskiy zhurnal," which began to expose Lysenko's rule as early as the end of 1952, was published there under the editorship of V. N. Sukachev. The names of Sukachev and Baranov, renowned Communist scientists and true leaders of anti-Lysenkoism, will always remain in the history of Soviet biology; their role in those difficult years was exceptional.

The biology discussion quickly encompassed other journals, and after Stalin's death letters from individual biologists about the harm which Lysenko's activity had done to the country began to reach the CPSU Central Committee, the Council of Ministers, and the USSR General Procurator. However, these publications and letters remained unanswered.

We were associates at the Botanical Institute and actively participated in this struggle, as did our colleague (now deceased), the famous geneticist Yu. M. Olanov, who worked at Leningrad University. Discussing the situation in the summer of 1955, we came to the conclusion that a collective letter had to be sent to the CPSU Central Committee, because at that time no collective action was considered criminal. The leadership would have to react to such a petition, we believed. The three of us decided to prepare the text of the letter without involving anyone else, and we worked on it a long time, heatedly arguing, formulating statements that satisfied each of us. A few friends knew about the plan for our letter.

We had no clear idea whom we would approach for signatures. We didn't have any idea the scope the affair would take on. Everything was decided when P. A. Baranov became acquainted with the letter. We assumed that an institute director should not risk signing the document, but he objected, "I should sign it first. If I don't sign it, you'll be asked, 'What about Baranov?'" The second person to sign it was D. N. Nasonov, corresponding member of the USSR Academy of Sciences, and soon there was no need to look for people who wanted to sign it; they looked for us.

P. A. Baranov sent the letter to Moscow, and the signature-gathering continued there. N. P. Dubinin, then former corresponding member of the USSR Academy of Sciences, got involved.

Letters from four scientists who wanted to support our petition with their own words were attached to the main text. The letter attached by the group of physicists was very important. We had prepared a brief text, and O. V. Zelenskiy, an associate of the Botanical Institute, took it to Moscow. During the war he had been director of the Pamir Biological Station and had become acquainted with physicists working there. All these materials were transmitted to the CPSU Central Committee with a cover note signed by P. A. Baranov and N. P. Dubinin.

The matter didn't end there. The letter lacked the signature of V. Ya. Aleksandrov, who was then on assignment in Dunshanbe. Upon his return, he organized the gathering of additional signatures, which were then sent to the Central Committee.

Unfortunately, we don't have the full list of signatories. This information can probably be obtained from the Central Party Archive. But the total number is known—297. Hence the name "Letter of Three Hundred." To describe their makeup, we'll point out certain names in the first hundred: geneticists B. L. Astaurov, R. L. Berg, A. R. Zhebrak, I. I. Kanayev, V. S. Kirpichnikov, I. A. Rapoport, V. V. Sakharov, N. A. Chuksanov; cytologists M. S. Navashin, I. I. Sokolov; botanists Ye. M. Lavrenko, A. S. Lazarenko, V. I. Polyanskiy, M. A. Rozanov, V. B. Sochaz, V. N. Sukachev, A. P. Shennikov, B. K. Shishkin; zoologists V. V. Alpatov, M. M. Zavadovskiy, L. A. Zenkevich, Yu. I. Polyanskiy, P. G. Svetlov, V. I. Tsalkin; virologist V. L. Ryzhkov; plant scientists F. Kh. Bakhteyev, P. N. Konstantinov, I. V. Larin, V. I. Edelshteyn; paleontologist Yu. A. Orlov; evolutionist K. M. Zavadskiy; soil scientist I. B. Tyurin; physiologist E. A. Asratyan; economist V. S. Nemchinov. Among them we see current and future academicians, institute directors, secretaries of institute Party organizations, etc.

We can present the full list of physicists who signed their own letter: A. I. Alikhanov, A. I. Alikhanyan, N. N. Andreyev, L. A. Artsimovich; V. L. Ginzburg, Ya. B. Zeldovich, P. L. Kapitsa, A. S. Kompaneyets, I. L. Knunyants, L. D. Landau, G. S. Lansberg, M. A. Leontovich, M. A. Markov, A. B. Migdal, I. Ya. Pomeranchuk, A. D. Sakharov, L. A. Smorodinskiy, I. Ye. Tamm, G. N. Flerov, D. A. Frank-Kamenetskiy, A. N. Frumkin, Yu. B. Khariton, A. I. Shalnikov. To them was added economist Ye. S. Varga, upset because he hadn't been given the opportunity to sign the letter against Lysenko.

This is a good place to present the text of the physicists' letter.

"To the CPSU Central Committee Presidium.

"We are not biologists, but carefully follow the development of biology of the USSR, and we know well what Lysenko's activity led to.

"Natural science is a unity, and the grave position in which Soviet biology has found itself for many years is having a negative effect on related disciplines and on the general level of science as a whole.

"Tremendous damage has been done to the international prestige of Soviet science.

"We share the feelings of the group of biologists which has sent a letter to the CPSU Central Committee and request your close attention to the abnormal situation existing in Soviet biology."

Apparently while this document was being signed I. V. Kurchatov became acquainted with our letter and obtained a copy of it. In the words of P. A. Baranov, both I. V. Kurchatov and A. N. Nesmeyanov, then president of the USSR Academy of Sciences, completely approved the collective action and assured him that they would speak on the matter to N. S. Khrushchev (as members of the Central Committee, they themselves could not sign such petitions). In his words, Khrushchev's reaction was sharply negative, and he called our letter 'disgraceful.' Nevertheless, Lysenko quickly ceased to head VASKhNIL, and in the position of head of the USSR Academy of Sciences Biological Sciences Division the obsequious A. I. Oparin was replaced by V. A. Engelgardt. And although the general attitude of the country's leadership to the Lysenko era did not change, its attitude toward genetics became more tolerant. We consider the letter's main success to be that biologists from the most varied

disciplines decisively and fearlessly spoke out against the anti-science and that biologists' isolation ended. Their affairs became the common affairs of Soviet scientists; their suffering, common suffering.

Until 1987, the Soviet press contained not a word about the "Letter of Three Hundred." It was impossible to publish information about a document which essentially criticized not only Lysenko, but also the Party leadership that supported him. The first brief reference appeared in the "Round Table" section of issue No. 4, 1987 of "Voprosy istorii estestvovaniya i tekhnika" ("Pages from the History of Soviet Genetics in Recent Literature"). It was contained in a verbatim report of D. V. Lebedev's speech and in an addendum to it (pp. 121-124). Unfortunately, this special edition, published in a small quantity (2,000 copies), was accessible to only a few. Therefore, R. Kuznetsova probably missed this report. The only reference to this publication, and a very remote one, is in A. Ye. Gaysinovich's book "Zarozhdeniye i razvitiye genetiki" [The Origin and Development of Genetics] (1988, p. 324).

All-Union Society for Informatics, Computer Technology Holds Congress

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INDUSTRIYA in Russian 17 Feb 89 p 1]

[Interview with First Deputy Chairman of the USSR State Committee for Information Science and Computer Technology I. Bukreyev, chairman of the organizing committee of the All-Union Society of Information Science and Computer Technology, by SOTSIALISTICHESKAYA INDUSTRIYA correspondent S. Panasenکو under the rubric "The Interview for the Issue": "Under Public Control"; date not indicated; first paragraph is SOTSIALISTICHESKAYA INDUSTRIYA introduction]

[Text] The Constituent Congress of the All-Union Society of Information Science and Computer Technology opens today in Moscow. What are the goals of the new society? What place does it propose to hold in the system of public organizations? First Deputy Chairman of the USSR State Committee for Information Science and Computer Technology I. Bukreyev, chairman of the organizing committee of the VOIVT [All-Union Society of Information Science and Computer Technology], answers these and other questions of our correspondent S. Panasenکو:

I. Bukreyev: In our country, unfortunately, the process of informatization is just beginning to develop. The years of stagnation also affected the development of domestic computer technology. As a result it is possible to characterize the lag behind the leading capitalist countries in this area no longer as a "strategically dangerous" one, but as an emerging "civilization gap." The ratio of the most important indicators of informatization for the USSR and the United States fluctuates in the range of 0.1 to 0.01.

There are many reasons for this. One of them consists in the fact that up to now all the decisions, which concern the informatization of the country, even of the strategic level, were made without the participation of the public and broad masses of specialists. Incidentally, it was no easy to do this, inasmuch as specialists were split up into a large number of departments and organizations, which often did not have an idea of what was going on at their neighbors'.

The primary task of the new society follows from this. With its organization the basic barriers, which separate specialists in computer technology, mathematicians, and programmers, who work in different sectors of the national economy, will collapse. It is important that the society will assemble as if "under one roof" the developers of means of informatization, those who produce the program product, and users. This will make it possible to consolidate their efforts for the sake of achieving the common goal.

We hope that the society will become an arena of creative discussions and the voice of collective opinion. Among the other tasks of the society I will name the protection of the copyrights and interests of specialists, who work in the field of informatization, the promotion of advanced know-how, the training of users of computers, and assistance in their introduction on the job and under household conditions.

The establishment under the society of cost accounting temporary creative collectives, centers of the creative scientific and technical work of youth, and introducing collectives will be an important direction. This is, on the one hand, a powerful means of involving in the matter of developing computer technology the creative potential of specialists, who are now isolated, and, on the other, a means of combining the achievements of academic, VUZ [Higher Education Institution], and applied science and production. At the same time the All-Union Society of Information Science and Computer Technology will be able to act as a public organization which is an opponent of some departmental projects and initiatives or others.

More than 200 recognized specialists in the area of informatization and computer technology from various corners of the country have gotten together at our congress. The draft of the charter of the society, which is aimed at the achievement of the listed goals, will be submitted for their attention. The difficulty is that the new society has a substantial distinction from the other scientific societies that are now a part of the USSR Union of Scientific and Engineering Societies. All of them either were organized on an occupational basis (chemists, geologists, and so forth) or unite the specialists of one sector. People of different occupational and departmental affiliation will be united in the All-Union Society of Information Science and Computer Technology. This, of course, makes the work of the society more complicated, but at the same time affords us additional opportunities.

Exposition Features FRG S&T Textbooks

18140178a Baku BAKINSKIY RABOCHIY in Russian
11 Jan 89 p 4

[Article (AZERINFORM): "Springer Verlag Offers"]

[Text] The West German publishing house Springer Verlag afforded figures of science of Azerbaijan the opportunity to acquaint themselves with works of scientists of various countries. Jointly with the USSR Academy of Sciences, it is holding a exhibition of the scientific and technical literature published by it, which has opened in Baku, at the library of the republic Academy of Sciences. Its goal is not only advertising, but also the conclusion of contracts for the delivery of literature.

At the exposition there are more than 700 titles of different books and journals on mathematics, physics, chemistry, geology, electronics, medicine, and other

fields of knowledge. In particular, the "Manual on Organic Chemistry," in which all known chemical compositions have been brought together and classified, is arousing interest. It was published for the first time more than 100 years ago, during this time has been republished more than once, being supplemented with new data, but to this day appears under the name of its compiler, the Russian scientist F. Belshteyn.

The exhibition has attracted the attention of scientists, many orders have been made.

The exposition of the publications of Springer Verlag has already been shown in Moscow, Riga, Kiev, and Minsk, while after Baku they will become acquainted with it in Tashkent and Frunze.